OIL WEEKLY

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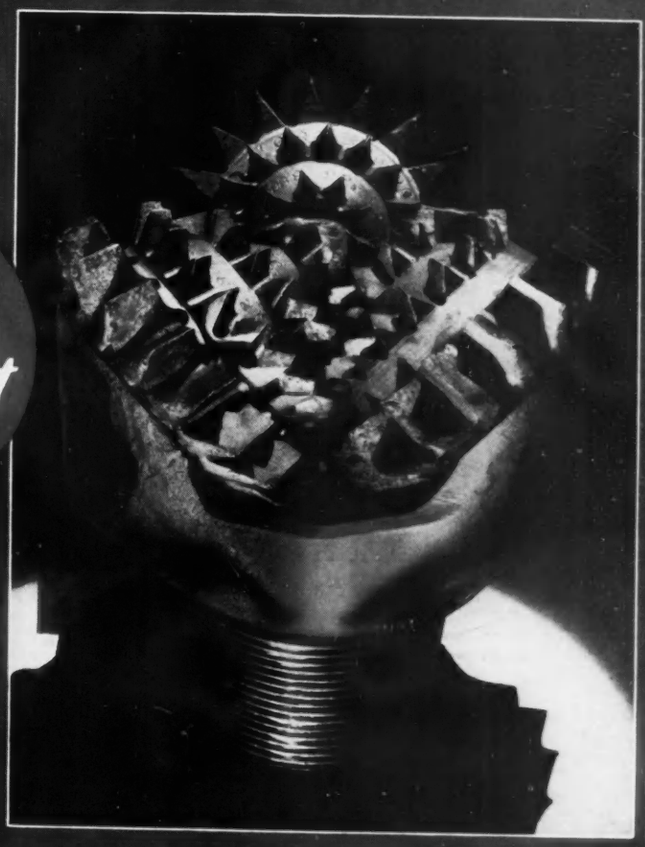
FOR THE PRODUCING AND
PIPE LINE INDUSTRY

THE WEEK'S NEWS
INTERPRETED

The
CHAMPION
Hole
Maker

Hughes
TAILOR-MADE
Rock Bit



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The
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Oil Man's Calendar

DEC. 6–10	American Society of Mechanical Engineers, New York.
14	Mid-Continent Oil and Gas Association, Annual Meeting of General Board of Directors, Tulsa, Okla.
14	East Texas Chapter, American Petroleum Institute, Kilgore, Texas.
17	Wildcat Christmas Jinks and Banquet, California Oil & Gas Association, Biltmore Bowl, Los Angeles.
28–30	American Chemical Society, Organic Division, Richmond, Va.
1938 FEB. 14–15	Kansas Oil Men's Association, Annual Convention and Exposition, Hotel Broadview, Wichita.
14–18	American Institute of Mining and Metallurgical Engineers, Annual Meeting, New York.
17–18	Mid-Continent District, American Petroleum Institute, Division of Production, Herring Hotel, Amarillo, Texas.
MAR. 16–18	Annual Meeting, American Association of Petroleum Geologists, Roosevelt Hotel, New Orleans, La.
24–25	Southwestern District, A.P.I. Division of Production, Spring Meeting, Blackstone Hotel, Fort Worth, Texas.
MAY 14–21	International Petroleum Exposition, Tulsa, Oklahoma.
23–25	American Petroleum Institute, Eighth Mid-Year Meeting, Wichita, Kansas.
	Natural Gasoline Association of America, Hotel Tulsa, Tulsa.
	American Gas Association, Natural Gas Department, New Oleans, La.

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Figure 158

Specify this 6000 pound cold working pressure valve for use on your high pressure piping. Stainless steel trim. Sizes: ½" through 2".

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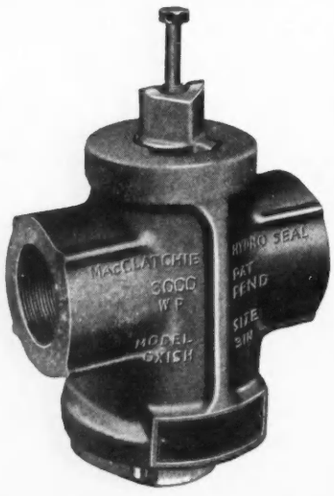

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LOOKING AHEAD

WITH THE EDITOR

Unique Rig with Many Interesting Features . . .

Interpretation of Drilling Mud Tests . . .

Water Flooding, Casing Welding, Directional Drilling . . .

IF YOU are not interested in a rotary rig layout that saves steam, that lets you drill a well with a single boiler, even when it's fired with coal, and that is specially designed to facilitate moving and rigging up, don't read the article in an early issue which will be titled "Illinois Rotary Rig Has Several Features." Because, if you are not interested in the above, you will not be interested in a layout that returns all exhaust steam to the boiler and you'll not be interested in the way each of three crews performs its assigned role in a procedure that cuts rigging and moving time to a minimum. But, because knowledge of such features means ability to economize, you'll want to read the article.

DRILLING mud is a subject that has intrigued operators of rotary rigs everywhere. But complaint has been registered that many of the articles written on mud have been too technical. Therefore, no hesitancy is felt in recommending for your anticipation "The Practical Interpretation of Drilling Mud Tests," scheduled for publication in a forthcoming issue of The OIL WEEKLY. The author brings pH's and such down to where the average good superintendent and driller can understand what it's all about.

IT'S NOT necessary to mention the plan to publish soon Part IV, the concluding installment, of Paul Torrey's treatise on water-flooding. If you've read the first three parts, you'll be waiting for the fourth. On top of that, Part III of Hodell's "Circumferential Field Welding of Casing" is on the hook. In addition, Earl Post, who knows South Texas like a darky knows molasses, tells of how directional drilling is opening up more Edwards lime production in spots where conventional drilling has failed.

The changing panorama

AMONG oil men, confidence continues to be bolstered by developments outside as well as inside the industry.

General business developments have been more encouraging now for several weeks, and conditions in the oil industry also have been more satisfactory for about three weeks.

Bankers Are Optimistic

A survey recently conducted by Reuben A. Lewis, Jr., executive vice president of the Metropolitan Trust Company of Chicago, revealed that the leading bankers of the United States expect the present business slump to run its course in about four months, without developing into a major depression. The bankers, through a questionnaire, registered a majority opinion that an upturn in business will occur in 1938, although not before late spring.

One of the bankers pointed out particularly that certain monetary influences usually existing before major depressions do not exist now; that there has been no serious over-expansion of credit. Bank reserves, excess reserves, and other banking funds for lending currently are at a high point, with low interest rates prevailing, he declared; while large funds are available, at the low rates, for building and other constructive uses. He attributed the present slump largely to the reaction from an over-anticipation of business inflation and to the failure of expected building activity to develop fully.

Cheerful Views Expressed

Various prominent men lately have re-asserted cheerful views, following similar earlier expressions. Jesse H. Jones, chairman of the Reconstruction Finance Corporation, was thus quoted: "We have not reached the stages of a depression . . . We probably got out too soon after our recent illness."

Sir Josiah Stamp, British financial authority and a director of the Bank of England, recently declared that Wall Street prices had declined to unwarranted extremes. Psychological influences, he believes, are now exaggerating the adverse implications of the real causes of the present readjustment, such as previous inflation, tax disturbances, war threats, labor difficulties, federal deficits, and so forth.

Further Upward Trends Expected

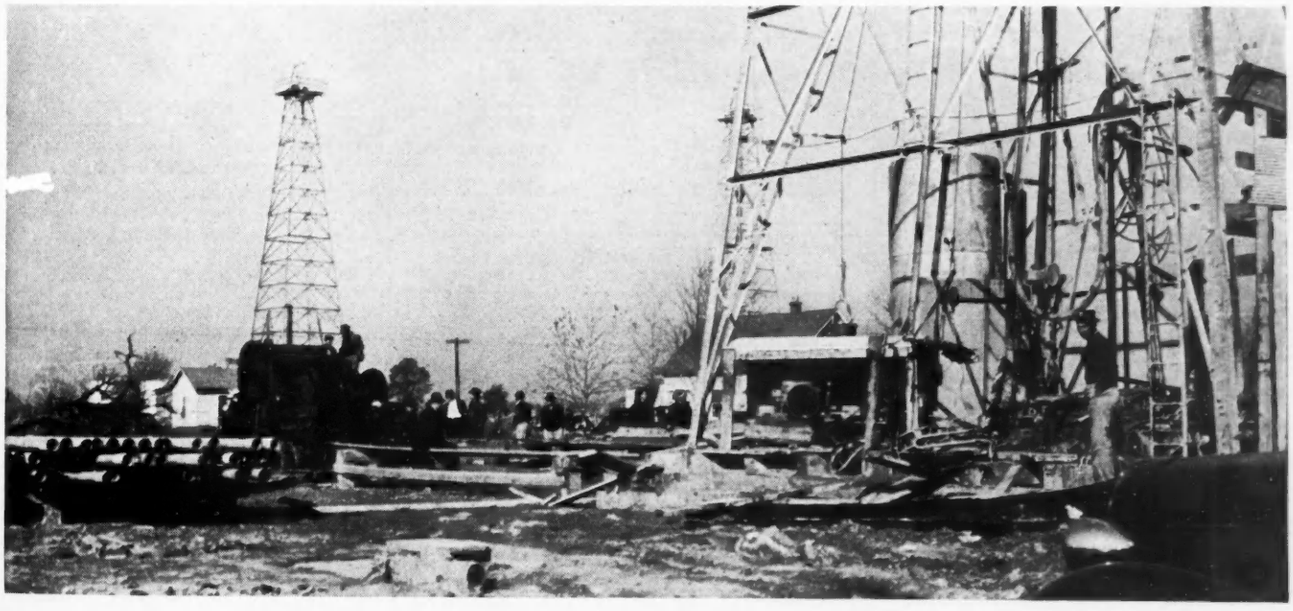
Various economists have openly subscribed to the view that business still is in an upward swing and that activity will resume the rising trend next year.

Numerous predictions have stressed the point that the present situation is not characterized by various evils of 1929. It is pointed out that in the recent years of recovery there has not occurred any over-building of residences, over-expansion of industrial plant facilities, over-building of inventories, or over-stretching of credit.

Furthermore, the readjustments that have occurred in the past several months are looked upon by some as beneficial, although painful. Lowered prices are expected to react favorably on trade, while reduced inventories are expected to put industry and commerce on a more stable basis. Unemployment that recently has developed already has been followed by diminishing strikes; and labor apparently has realized that wages as well as prices must remain reasonable, if trade is to flourish.

The present business slump consequently may

Noble Townsite Scene, the most active drilling spot in Illinois. The well at the right was completed recently for an initial flow of 360 barrels.



result eventually in a sounder and longer period of prosperity.

Gasoline Mars Oil Picture

In the picture in oil, the weak gasoline market remains the principal blot. Gasoline stocks. now above 70,000,000 barrels. are 21 percent larger than at this time last year; although total gasoline demand lately has been running only about 10 percent higher.

Furthermore, further heavy additions to gasoline storage are in prospect, because of the necessity for active refinery operations, in turning out enough fuel oil to supply increasing numbers of domestic burners.

Nevertheless, the gasoline market has been holding unchanged for several weeks, whereas prices previously had been declining steadily.

Furthermore, the possibility of further immediate decline of gasoline prices does not appear strong, in view of present strict control of crude oil production and the resultant steadiness of crude prices.

Hot Oil Control Strengthened

New regulations for application of the Connally hot oil act, approved by President Roosevelt in executive orders December 1, are designed to "tighten up" the administration of the act. Official standing is given the Petroleum Conservation Division of the Interior Department, and the Federal Petroleum Agency is merged with Tender Board No. 1.

Announcing the new regulations, the department said hot oil has been reduced to a negligible quantity; but in findings in the regulations themselves, it is revealed that there are possibilities in the field for heavy hot oil running and that there are actually in the field now "large quantities of contraband oil, a substantial part of which is available immediately for transportation."

Oil Confiscation Upheld

Coming to the rescue of the Texas state authorities, the Supreme Court at Washington on December 6 rebuked a Texas bankruptcy court for attempting to stop the state from proceeding with efforts to seize alleged "hot" oil in the possession of an oil company which filed a reorganization petition under Section 77B of the National Bankruptcy Act. The filing of such petitions, it was held, may not deprive the state of opportunity to establish its claim to illegal oil.

Drilling

THE GAP between wells on the east flank of Wasson structure, West Texas, was shortened last week by a 1¼-mile southeast extension of flowing production. Before it reached the main lime section a wildcat extended Judkins pool in Ector County 1¼ miles west when it started making oil from lime at 3445 feet.

Oklahoma featured a Canyon lime well in the West Frederick area that swabbed 328 barrels. A deep test in Fox pool had a light show of oil in Oolitic lime at 7940-50 feet. The west end of Cement pool was established by a failure. An attempt to recover casing from a Lovell area wildcat resulted in a 40-million cubic foot gas and salt water blowout.

Kansas reported a new pool in Russell and another in Chautauqua County. Pools in Rice, Marion, Ellis and McPherson counties were extended, and an extension looks likely for Pawnee Rock pool of Pawnee County.

Arkansas recorded the largest completion in a long time when the third well completed in the Marine horizon at Schuler initialled 181 barrels per hour.

Illinois oil interest moved into Olney's back yard when a test cored excellent McCloskey saturation below 3050 feet. Production in the state has passed the 20,000-barrel mark, with a daily yield in excess of 25,000 barrels predicted by New Years.

South Texas Coast indicates Victoria County will be its hot spot in 1938. Placedo and Keeran fields were connected by a wildcat, and Heyser and McFaddin fields received extensions. A 6500-foot Frio sand strike was recorded in southern Jim Wells County.

A Zavalla County wildcat at Batesville showed for a producer, opening a vast area of the Balcones Fault zone to Edwards lime exploration, in Southwest Texas. A Frio sand discovery at La Reforma in Starr County was completing at 6127 feet. A deep test in Hidalgo County found more sands near 9000 feet.

Mirando district of Texas recorded a 1½-mile southwest extension of Las Animas, Jim Hogg County. Two wildcats in the Oilton area of Webb County added three miles to the trend's producing zone. Pettus sand in North Sweden was extended 3600 feet.

Market briefs

Outlook—Markets promise to hold for rest of year.

Crude Markets—Remain steady.

Refined Oil Markets—Gasoline market unchanged for third consecutive week.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
December 4	3,387,000	3,230,000
Previous week	3,425,800	3,325,000
Year ago	3,000,200	2,990,000

CRUDE STOCKS

Date	Crude Oil (Barrels)
November 27	304,156,000
Week ago	304,324,000
Year ago	288,630,000

REFINED OIL STOCKS

Date	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
December 4	70,193,000	121,329,000
Week ago	68,544,000	121,616,000
Year ago	57,696,000	110,287,000

DRILLING

Period	Wells Completed
Past week	622
Previous week	494
Year ago	509
Year Total:	
This year	27,914
Last year	23,051

Technology

DEFINITE strides made in the application of acid to Texas Panhandle gas wells in many instances are resulting in open flow potentials far exceeding natural completion production. The recent improvements and results are interestingly described on page 19.

The development of water flood properties is the subject of Paul D. Torrey's third installment on water flooding, which commences on page 28. Drilling patterns, costs, oil content studies, water supply and other elements are discussed.

An evaluation table that will be found very useful in making a rapid check on the value of a producing property, where any sort of depenadble production record is available, is the interesting feature in an article on page 38.

L. R. Hodell, on page 40, continues his interesting discussion of circumferential field welding of casing. The first installment appeared a week ago. The present chapter deals with the many tests conducted in this interesting study.

How a case of particularly difficult flange leaks in the discharge line of a battery of pipe line pumps was overcome is described in an article on page 17.

Oil in the Courts

Four more trust defendants released . . . Refiners deny majors conspired . . . Texas trust trial set for next fall . . . Texas wins confiscation suit

WHATEVER the outcome of the anti-trust trial at Madison, the oil industry will be faced immediately with another "oil price conspiracy" suit. This developed last week, when the trial date of the Texas anti-trust suit was set for next fall. Meanwhile, four more individual defendants in the Madison case were granted directed verdicts of acquittal. The defense continued to present its testimony, with a number of independent refiners testifying that the major concerns indicted were not guilty of "conspiracy."

Last week also saw the United States Supreme Court rule that the State of Texas can institute confiscation proceedings to recover oil illegally produced, even though the company is in bankruptcy court. This reversed a lower court's decision, and was hailed by proration agents in the state as a most important precedent.

Several other legal affairs of the industry, all of much less importance, took place during the week.

Madison trial

Federal Judge Patrick T. Stone last week granted motions for directed verdicts to four more individual defendants, bringing to 37 the number of individuals remaining on trial with 16 major oil companies at Madison, Wisconsin, for alleged conspiracy to raise the retail price of gasoline in 10 Mid-Western states through the operation of "buying programs" in the East Texas and Mid-Continent fields during 1935 and 1936.

Those released last week were John A. Welch, Shreveport, Louisiana, sales manager for Louisiana Oil & Refining Company; R. R. Irwin, Kansas City, Missouri, manager of the White Eagle Division of Socony-Vacuum Oil Company; Ira A. Smith, Tulsa, Oklahoma, buyer for Standard Oil Company of Indiana, and R. O. Audrain, Tulsa, Oklahoma, buyer for Tide Water Oil Company of Oklahoma.

The court denied motions for directed verdicts filed on behalf of certain other individual defendants, for the most part high officials of defendant companies, but left the door open for similar motions when all the evidence has been given the jury. "In the present state of the record, the court is of the opinion that the government is entitled to have the issues in the case submitted to the jury," Judge Stone said.

Since conclusion of the government's presentation four weeks ago, seven oil companies, three trade publications and nine individuals have been acquitted of the charges on which trial started ten weeks ago. Four companies, the trade journals and one individual were freed as the result of motions offered by prosecution attorneys who expressed belief that their evidence was insufficient to sustain a conviction as among their reasons, and the others were released on directed verdicts granted by the court after almost two weeks of argument.

The court's ruling against motions of other individual defendants brought announcement from counsel for Socony-Vacuum Oil Company that they "rested" the cases of Charles S. Jones, former vice president, and Bryan S. Reid, Chicago division manager as of the close of the government's case, leaving defense counsel to offer evidence with respect to the remaining 30 individual defendants.

Arguments between opposing counsel consumed many hours as the trial tediously wended its way through its tenth week. Hope, which alternately blossomed and was trampled during the past few weeks, that the trial may be concluded before Christmas all but died as prosecuting attorneys last week raised objection on objection to testimony brought forward by defense counsel, necessitating frequent "rehearsals" before Judge Stone with the jury excused before rulings on the objections could be given. Present estimates on the trial's termination range from the first to third week of January.

Shatford Testifies

Testimony that curtailment of production at the request of officials who administered the refinery section of the code forced major companies in March, 1935, to purchase gasoline to meet an unprecedented demand that found them short of requirements was given by J. E. Shatford, independent refiner of El Dorado, Arkansas, and a former national coordinator in charge of administrating the refinery section. This condition, he said, had tended to "firm the market."

During five hours of wrangling between opposing attorneys, defense counsel sought to bring in evidence that Ickes, unable to pass on every detail connected with efforts to stabilize the market, had in his 1935 report, prepared during the following year, commended the industry's cooperation in bringing about the "desired parity" of gasoline prices. It was also shown that the report of Ickes' petroleum administration board, issued at the same time, commended the results obtained.

When recalled to the stand, Shatford credited increased prices in the spot markets during March, April and May, 1935, to the Connally hot oil act, to the voluntary curtailment in refinery production previously mentioned and to an unexpected increase in gasoline consumption that started in early spring and continued throughout the year. His testimony was a direct blow to the government which charges buying activities "without regard to needs" on the part of major companies were responsible for the advance in tank car market prices.

The witness said that the 3¼-cent a gallon low price in March reflected the influence of gasoline manufactured from illegally-produced crude before the Connally act was set up. When the law relieved the pressure, gasoline spot market prices tended to rise. After the major companies had curtailed their own production by approximately 960,000 barrels, demands for gasoline in March exceeded supplies by 900,000 barrels, leaving them short about 1,800,000 barrels, he said in explanation of his second reason. In the succeeding months of April, May and June, demand approached record-breaking levels and by the end of May the companies were 3,000,000 barrels short of stocks necessary to meet their demand. A sudden increase in export demand which began in June of that year further complicated the picture.

Association Described

Judge F. W. Fischer, Tyler, Texas, who represented refiners in the Panama-Amazon case which invalidated "Nine-C", the original hot oil section of the National Recovery Act in January, 1935, was called as a defense witness following the testimony of Shatford. He said he regarded the proration law passed by the Texas legislature in December, 1935, as valid and advised refiners to form the East Texas Refiners Marketing Association to market legal gasoline.

In answer to a government contention that the association was instigated by major companies through Neil Buckley, of Cities Service Export Company and alleged "liaison" man, to facilitate sales of gasoline in furtherance of the alleged conspiracy, Fischer testified that he did not meet Buckley until the latter came to his office to inquire whether members of the new association were acting in good faith before asking major companies to purchase gasoline through the organization. "I

WOULD CANCEL MANY TEXAS BUSINESS PERMITS

Secretary of State Edward Clark has announced that he will deny to corporations permits to do business in Texas, unless the corporation actually conducts business in the state where its charter was issued.

This would hit many of the state's larger firms, including many oil companies incorporated under the State of Delaware.

Clark said that permits now effective would be scrutinized carefully when annual tax returns are made next March, and that in those cases where it appeared that the company had little or no business in the state where it was chartered, he would ask the attorney general to sue for cancellation of the permit to do business in Texas.

told him they were in good faith because they were obliged to be in good faith," Fischer said.

The witness, who said he owned 39 wells in Texas which the state railroad commission declares are capable of producing in excess of 800 barrels an hour each but are choked to 20 barrels a day, said that the commission fixed the allowable of the East Texas field at 400,000 barrels a day. "However, that wasn't necessarily the amount produced," Fischer added, explaining the exact amount produced was unknown, but "as the representative of the folks that produced the excess, I guess I know as well as anybody." The witness estimated the excess at between 150,000 to 200,000 barrels a day. "I don't mean to say that my clients went out deliberately to violate the law. They were running under the protection of injunctions," he explained.

Marion Travis, independent refiner of Houston, Texas, who described himself as one of the organizers of the East Texas association, said the organization was formed before Buckley arrived and that he suggested that the association solicit Buckley's aid in finding customers among major companies for surplus gasoline. Answering questions put by William J. Donovan, chief of defense counsel, Travis said that no major company representative suggested employment of Buckley or discussed the Cities Service official with him "in any connection," but that Buckley's aid was sought because refiners knew him as a "square shooter."

"Did any of the defendant companies have anything to do with the formation of the East Texas association?" Donovan asked. "Nothing whatever," Travis replied.

General testimony in denial of the conspiracy charges was suspended, for the time being at least, when L. S. Wescoat, vice president and secretary of Pure Oil Company, was called to testify on matters pertaining to his company. He had previously testified as a government witness. During the period covered by the conspiracy, Pure Oil Company was required to purchase large quantities of gasoline because of inability to produce sufficient gasoline to meet its requirements, Wescoat said, adding that the company never bought at prices above low quotations reported in the trade journals, and that purchases in East Texas and the Mid-Continent were only a small portion of the company's total purchases. A system of graphs mounted on a frame that towered over 12 feet toward the ceiling of the courtroom which showed the relation of the company's production, inventories and purchases with respect to sales requirements were explained by the witness.

Texas trust trial set for October 3

The trialof the Allred Anti-Trust Suit in State District Court has been set for October 3, 1938, at the request of Attorney General William McCraw.

Although defendant oil companies had some 90 days to file an appeal in the United States Supreme Court, seeking relief from the decision of the Texas Supreme Court, it is believed that the case will go to trial as scheduled.

At the time he was attorney general, Governor James V. Allred filed suit against 15 major oil companies which sell gasoline in Texas and two marketing associations, alleging that the groups conspired to fix the price of gasoline sold in the state. As the trial of the case began, the defendants filed a general demurrer which was sustained. In this demurrer they contended that the Texas Anti-Trust laws had been superseded by the National Industrial Recovery Act, since held unconstitutional.

Supreme Court decision rebukes bankruptcy court

Interference by the Federal bankruptcy courts with efforts of Texas to enforce its conservation law and to take punitive action against violators was banned in Washington by the United States Supreme Court, December 6, in a 7 to 2 decision rebuking the bankruptcy court for resisting the state's efforts to seize 77,000 barrels of oil held by the Trinity Refining Company and alleged to have been produced illegally.

State Sued First

The state had sued the company to recover fines and penalties for violation of the conservation laws, and the district court had appointed receivers of the defendant's property pending trial of the case. Later, the state sued the company to recover delinquent taxes.

Within four months after commencement of the first suit, the company filed a petition in the district court for a reorganization under Section 77B of the National Bankruptcy Act, and a trustee was appointed who was directed to take possession of the company's property and who took from the state's receivers all property held by them, including the oil.

Withholds Consent

Texas applied to the bankruptcy court for permission to bring suit in a state court to obtain judgment of confiscation against the oil; the court withheld consent and directed the trustee to retain the oil, and its action was affirmed by the Fifth Circuit Court of Appeals, from which the state appealed to Washington.

"Forfeiture of unlawful oil under Texas law is a penalty imposed to vindicate the state's policy of conservation. The bankruptcy court exercises jurisdiction under sovereignty that is independent of and foreign to that of Texas. It is without power to enforce penalties imposed by the state for violation of its laws," the Supreme Court decision delivered by Associate Justice Butler said.

Gist of Decision

"If, when the debtor's petition was approved the oil did not belong to Texas, the state was not entitled to have it withheld from the trustee. But, if by reason of unlawful production or transportation, the oil had already by forfeiture become the property of the state, the trustee was not entitled to take or retain it. If in a suit brought by Texas in a state court it should be determined that title to the oil had vested in the state before approval of the debtor's petition, the bankruptcy court doubtlessly will recognize that title and direct the trustee to hand over the oil or account for it to the state.

"The filing of the petition for reorganization in the bankruptcy court may not be held to deprive the state of opportunity in its own court to establish its claim that through forfeiture it had already become the owner of the oil, for that would be to take the state's property for the benefit of the offending company or its creditors. Nor may the receivers' voluntary surrender of possession to the debtor's trustee prevent adjudication of the state's claim. The bankruptcy court abused its discretion in denying the state's application for permission to institute proceedings in the state court."

Two Dissent

In a dissenting opinion in which Associate Justice Stone concurred, Associate Justice Cordozo contended that the action of the bankruptcy court was proper and that it had no duty to surrender the oil to make effective a forfeiture of property of which the state was not the owner.

The dissenting opinion took the stand that the bankruptcy court was in a different sovereignty, as if it were in a different state, and held that had the oil been transported to California and was in the possession of receivers for a California corporation the state would not be able to contend it should be returned to Texas to make a forfeiture good.

To appeal confirmation of U. S. title to Section 36

Attorneys for Standard Oil Company of California will appeal the decision of Federal Judge Leon R. Yankwich which December 4 confirmed the government's title to Section 36 of Elk Hills oil field, ownership of which has been the subject of litigation stretching over a score of years.

From the federal bench in Fresno it was stipulated that Standard Oil Company of California must pay the United States government $6,164,102.42 as damages inflicted by exploitation. The section of land itself has a value estimated at $10,000,000.

Judge Yankwich's decision was based on a single issue: whether the land was known to be mineral bearing when surveyed in 1903 prior to its conditional release by the government to the state as school land. The government counsel argued affirmatively, company counsel to the contrary.

Section 36 having been previously sold by the state to settlers, Standard Oil Company of California began buying it piecemeal from them in 1909. Government's argument brought out that an Act of Congress in 1853, giving the sixteenth and thirty-sixth sections to California for school lands, stipulated there should be no transfer of title on sections known to be mineral bearing. The judge cited the action of the California legislature in 1901 in asking the secretary of the interior to investigate possible fraud where mineral properties in California were being entered as agricultural lands.

The government's move to reclaim Section 36 was started in 1914 by the general land office. About 40 wells have been drilled on the mile-square lease.

Proration Picture

Sunday shutdown question to be aired . . . Arkansas calls two field hearings, receives three suggestions for Rodessa . . . K-M-A favors 20-acre spacing rule

WITH proration actions of the week comparatively few, speculation as to developments that would take place at forthcoming important hearings held the center of the stage.

Coming Proration Hearings

Foremost among the proration hearings to be held shortly is the Texas statewide hearing next week, for as Texas goes so goes the United States production curve. Several questions of importance are scheduled to be up for decision at this hearing.

Second in importance was the scheduling of hearings for two new Arkansas fields. Interest in these are due mainly to the postponing of effective control in the Arkansas portion of Rodessa, and they may provide some indication of what this state is going to do with its proration problems.

Sunday Shutdown Texas Question

Prospects for continuing the shutdown of the East Texas field into the month of January will be a subject of much interest to operators attending the statewide hearing to be held in Austin, December 17. Yesterday, December 12, the final shutdown provided for in the current order was completed, and railroad commission engineers were to have made the usual tests.

Whether the market for crude oil will have recovered sufficiently to increase the demand for Texas crude for January will probably be the factor which determines finally whether the shutdown will be extended. Despite differing statements made by members of the railroad commission, it is entirely possible that they could agree to continue this program which has worked so far.

The principal point noted everywhere is that no operator was so dissatisfied with the results that he saw fit to protest seriously against this first shutdown period. For example, the Tyler Chamber of Commerce named a committee to come to Austin and object to the order and to oppose emphatically any further extension. That committee came to Austin, or at least one member did, and announced that he had not seen the commission and that he did not intend to see the commission, because he had been satisfied by private reports which he had obtained.

Many independent operators who have visited Austin have pointed out that, though they lost an allowable for four days, the price of oil did not break, and they intimated clearly that they had more fear of the latter than the former.

Arkansas Hearings Scheduled

The Arkansas Board of Conservation has called a special hearing at El Dorado December 20 to consider rules and regulations for the newly opened Permian lime oil field at Buckner, Columbia County, Arkansas, where Standard Oil Company of Louisiana recently completed a well at 7258 feet. The rules as applied to the field will include regulations for tests in both Columbia and LaFayette Counties in Township 16 south, Ranges 22 and 23 west.

At the same hearing the board announced it would determine the allowable for January for Schuler field, Union County, recently found productive of oil in the lower Marine and of gas and distillate in the Permian lime, both below 7500 feet.

Other Proration Meetings

The Oklahoma Corporation Commission has set December 29 as the date for its regular monthly statewide proration hearing at which the January crude oil market demand will be determined. Allocations to fields will be made following the hearing.

The Texas Railroad Commission has scheduled a hearing for December 20 to consider special rules for operating in the south Bennett field in Young County.

Files against Panhandle gas order

The Consolidated Gas Company has filed suit in Federal Court at Austin, seeking to set aside the order of the Texas Railroad Commission prorating gas in the East Panhandle field.

The new order was to become effective on December 1 and is expected to establish a precedent for fixing allowables in Texas, so far as gas is concerned.

This week Attorney General William McCraw filed suit in the 53rd District Court at Austin, the state court, asking the court for an injunction which would forbid the Consolidated Gas Company from violating the commission's order.

By this legal strategy, McCraw succeeded in obtaining a trial of the case in the state's court first, unless the Consolidated Gas Company is successful in obtaining a three-judge federal court to pass upon the constitutionality of the law.

New Rodessa Plans Proposed in Arkansas

At an Arkansas Board of Conservation meeting last week, three substitutes for the proposed allowable order for the Miller County (Rodessa) field were submitted.

The rule of the board, originally scheduled to become effective November 1 has been postponed four times. It is supposed to go into effect January 1 now, and provides for the basing of allowables 50 percent on acreage and 50 percent on bottom-hole pressure, using gas/oil ratios as a determining factor.

One proposal, whose author said there were seven factors contributing to waste oil and gas in Miller County, would give allowables for each well in the field as of December 1, and after that date each well completed would be given a production allowable equal to what it would have had, had it been completed before December 1. This plan would be based on gas/oil ratios and bottom-hole pressures.

A second proposal was a gas/oil ratio limit not to exceed 2000 to 1. The third proposal was for an allowable order based 25 percent on acreage, with a basis of one well to 20 acres, and 75 percent on potential, with the gas/oil ratio and bottom-hole pressure used as a factor.

Meanwhile, the Louisiana Conservation Commission has taken steps to keep all wells on the Louisiana side of the Arkansas end of Rodessa within their December allowable. Two wells have been running higher amounts.

Ickes given authority to act as agent of president

New regulations under the Connally contraband oil act, promulgated by Secretary of the Interior Harold L. Ickes, October 6, were given the approval of President Roosevelt in a series of executive orders signed December 1 and made public last week by the department.

The new regulations, it was explained, were designed chiefly to avoid the possibility of any legal question being raised as to the authority of the secretary of the interior to act as the agent of the president under the Connally Act.

The executive orders give official recognition to the petroleum conservation division, created subsequent to enactment of the Connally law, and provide for a number of changes in the regulations to accomplish more effective administration.

Abolish Agency

A major feature of the orders was the abolishment of the Federal Petroleum Agency and transfer of its administrative and investigative functions to the Federal Tender Board, which is to be accomplished without any changes in personnel. Both boards were located at Kilgore, Texas.

While it was said at the department that "the operation of the law as administered by the department of the interior, with the cooperation of the department of justice, has been successful as demonstrated by the fact that 'hot' oil has been reduced to a negligible quantity," it was indicated in the new regulations that the possibilities of extensive "hot" oil running still exist in the East Texas field.

K-M-A favors 20 acre spacing rule

Majority of the property owners in the K-M-A deep oil area, now rated as the largest field in the North Texas district, are on record with the Texas Railroad Commission as favoring 20-acre spacing, and production penalties for wells drilled as exceptions to the plan.

Separation of the K-M-A deep field from other North Texas district areas

[*Continued on Page 62*]

Labor Situation

Shell workers reject offer . . . Texaco votes for CIO . . . Pine case set for hearing . . . Strikers picket Richfield stations . . . Stroud strike ends

ALTHOUGH no important developments in the labor situation of the oil industry occurred during the past week, a few events of interest may be summed up as follows: Shell Petroleum Corporation's proposal to end refinery strike was rejected by union; Pure Oil Company's labor case was concluded; the labor case of W. B. Pine was set for hearing December 10; the strike at Allied Refinery and Products Company's plant was ended; and strikers picket stations of Richfield Oil Company.

Shell Refinery Still Closed

Although various attempts have been made in the past to settle peacefully the dispute between Shell Petroleum Corporation and its refinery employes, striking union workers of the company last Thursday rejected a proposal to end the three week's old strike. The union recently filed charges with the National Labor Relations Board against the company, in which the union alleges that the corporation intimidated union members and refused to negotiate a new contract. Dr. Edwin A. Elliott, regional director of the relations board, recently came to Houston to investigate the strike and the charge filed by the union. Meanwhile officials of the company and an appointed union committee will make further efforts to bring about a peaceful settlement and an early discontinuation of the strike.

Pure Case Concluded

A national labor relations board hearing of charges of unfair labor practices brought against The Pure Oil Company by Oil Workers' International Union, was concluded last Tuesday. At the conclusion of the meeting, Karl Mueller, trial examiner, pointed out that the National Labor Relations Act had been designed to protect the right of the workers to organize and bargain collectively. The final session was devoted to four unions, each of which claimed to represent a majority of employes of the company's refinery at Muskogee, Oklahoma.

Pine Case in Court

Federal Judge Eugene Rice of Muskogee, Oklahoma, last week set for hearing December 10 a petition by W. B. Pine, independent oil operator, for a permanent injunction to prohibit the Oil Workers' International Union from interfering with drilling operations on his Seminole area leases. According to the court, Pine's request for an immediate restraining order could not be granted without a full and complete hearing. A hearing also is scheduled for December 10, involving a petition of the Sasakwa local chapter of the union contending that the federal court is without jurisdiction to hear Pine's petition.

A three week's old plant strike, affecting the Allied Refinery and Products Company, Stroud, Oklahoma, was settled peacefully last week. Strikers voted to return to their jobs after officers of the C.I.O. affiliated oil workers' union told them the strike was unauthorized.

Strikers Picket Stations

Declaring the company's practices unfair, a central labor council ordered pickets to halt deliveries of gasoline to all service stations operated by Richfield Oil Company, Seattle, Washington. The unions involved are demanding higher wages for employes.

Texaco Employes Name Agency

A majority of employes of The Texas Company's refinery at West Tulsa, Oklahoma, have named the local chapter of Oil Field, Gas Well and Refinery Workers, as their sole bargaining agency. In an election 207 employes voted for the C.I.O.-affiliated union, and 53 for the employes federation.

Firms Benefit Employes

Plymouth Oil Company, with headquarters in Pittsburgh, Pennsylvania, recently ordered a Christmas bonus for all its employes. The bonus will be two week's salary or wages to all employes on the pay roll of the company and its subsidiary, the Big Lake Oil Company, for more than a year. Employes of less than a year's service will receive one week's pay.

Magnolia Petroleum Company, Dallas, Texas, recently announced that directors of the company had voted increases in vacation periods and insurance benefits for all employes. Under a revised vacation plan, effective next year, all employes of 15 or more years service will be given three weeks vacation with pay, representing an increase of one week.

The increased benefits, effective immediately, and affecting only employes having served 20 years or longer and not having reached the retirement age of 65, provide an extra year's salary for families of employes who die before the retirement age.

Pennsylvania Law Softened

Problems faced by operators of Pennsylvania's 95,000 stripper wells under the state's new 44-hour work week which becomes effective January 3 will be "solved" by a state industrial board ruling allowing employers of three or less persons to maintain 54-hour weeks, divided into six 9-hour days and by another ruling on continuous operations, Ralph M. Bashore, secretary of labor and industry and administrator of the law, said last week.

Referring to the exemption granted employers of three or less persons, Bashore said, "Most stripper wells have so few employees that they would come within this class."

Additional relief will be given the oil industry, particularly the manufacturing branch, by the continuous operations rule, Bashore added. This rule specifies:

"Employers in continuous and multiple shift or tour manufacturing and public utility industries working eight hours or less per shift may interpret the day to be the calendar day and the week the calendar week, provided that such employees have a rest period of at least eight hours between successive days of work.

"An employer may permit an employee to work one additional shift or tour of duty per cycle in those industries provided at least eight hours intervene between shifts or tours and further provided that such change in shifts and tours will result in each employee working in a period of 20 weeks not more than 44 hours per week on the average.

"Where the failure of an employee to report for work in a particular shift would result in the unemployment of others or in the possible destruction of property or failure of service, an employer may employ a worker for the previous shift until the absent employee is replaced."

Bashore indicated that a specific ruling to apply to the oil industry would probably be issued before the law becomes effective next month.

To Test Pennsylvania Law

Meanwhile, Sterling G. McNees, Harrisburg attorney and a former president of the State Bar Association, announced he was preparing to file a suit in Dauphin County court which would attack the law on the grounds that it is an unconstitutional delegation of legislative authority in that it grants the industrial board in the department of labor and industry power to grant variances and exceptions, that the industrial board exceeded its power under the act in extending the period of enforcement for most industries beyond the effective date, or from December 1 to January 3, and that the act serves as a "tariff barrier" because it gives competitors from outside the state an unfair advantage.

McNees refused to name the client on whose behalf the suit will be filed.

Six-Day Week in Canada

Operators in the Turner Valley field of Alberta, Canada, were ordered last week to place all workers on a six-day week of eight hours a day not later than December 15. The order was issued by W. D. King, deputy minister of trade and industry, who said there would be no exceptions to the order.

The order was originally issued in September, but protests of operators that a shortage of skilled workers because of rapid development of the new field would bring a shut-down of wells over week-ends and discourage further development brought a compromise with exceptions for cathead men, leadtong and drillers.

Workers in the field are said to favor the six-day week, but the plan is receiving the opposition of some operators, who maintain the short week will destroy unity in drilling crews.

Meanwhile, at Edmonton, Fred J. White, president of the Alberta Federation of Labor, announced a brief for a 30-hour work week throughout the Province will be submitted to the Alberta government late this month.

Oil Situation Good As Year Wanes

Results were favorable in November, and outlook for December is promising. Light inventories and strict production control are bolstering markets.

By L. J. LOGAN, Associate Editor

THE petroleum industry achieved generally satisfactory results in November, and the outlook for the final month of the year is similarly promising, indicating that the industry will reach the end of 1937 in a comparatively good position.

Operations at wells and refineries were curtailed in November to quite moderate proportions, and inventories were held down at desirable levels, with the exception of gasoline stocks, which have remained excessive.

In fact, gasoline furnishes practically the only blemish on a generally bright picture, in so far as the conditions within the oil industry itself are concerned; although the disturbed general business conditions also are reacting unfavorably toward the oil business.

Having failed to hold gasoline output at the refineries down properly, the industry now finds itself with 21.7 percent more gasoline in storage than at this time last year. This increase in gasoline stocks is not justified by the gain that has occurred, meanwhile, in gasoline consumption. The demand for gasoline has been running only about 10 percent higher this year than last year, and recently there has been some leveling off of the rising trend.

Gasoline Demand Tapering

In September the total demand for gasoline was 10 percent larger than in that month last year, but only through benefit of unusually brisk export business, reflecting present wars and threats of wars. Whereas the domestic demand for gasoline for the first nine months of 1937 was 9.3 percent larger than for the similar period last year, the domestic requirements for September were only 6.6 percent greater this year than last year.

The large gasoline stocks undoubtedly have been largely responsible for the material decline of gasoline prices, wholesale and retail, in October and November.

However, the comparatively large stocks are at least partially justified by the above mentioned gain in demand for gasoline and by the fact a considerable portion of the increase in stocks has been occasioned by new facilities, such as gasoline pipe lines and new bulk storage plants, to meet the greatly expanded motor fuel markets. The substantial quantities of gasoline that have gone into these new facilities have become necessary working stocks and cannot be regarded as marketable gasoline.

Furthermore, the demand for gasoline probably will continue heavy even in the face of a minor or major business depression, judging by the record in the past depression. Although the demand for most commodities declined after 1929, gasoline consumption was greater in 1930 and 1931 than in 1929. Some economists at present, although expecting less business in general in 1938 than in 1937, anticipate that gasoline demand will show a further increase of about 5 percent.

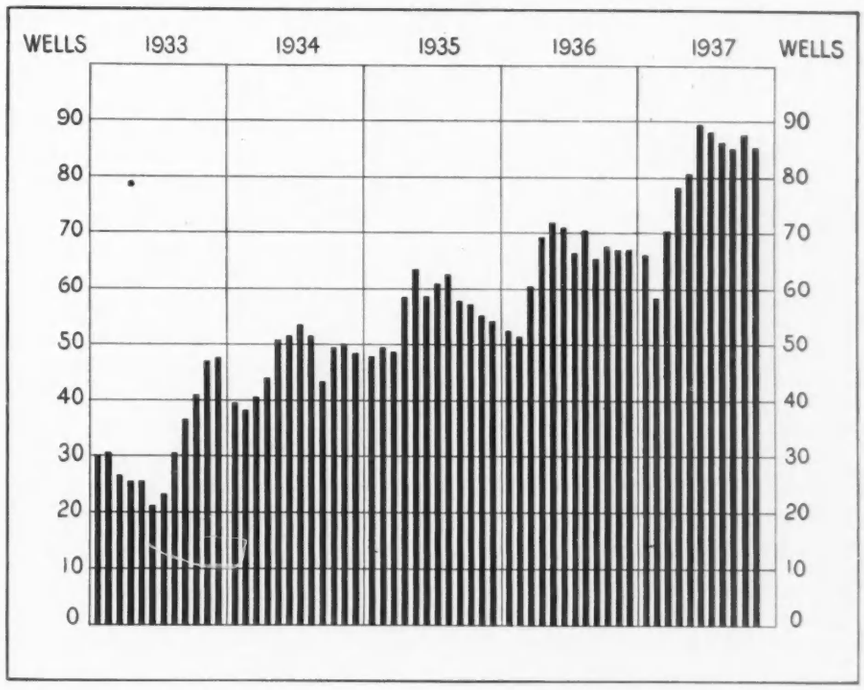
Nevertheless, the reaction of gasoline prices in November, as in October, was cause for much concern. The tank car prices of gasoline at refineries in November declined over ¼ cent a gallon on the average, an amount similar to that of October. During those two months prices to dealers and retail postings also have declined substantially.

The gasoline tank car prices consequently are now somewhat lower than at this time last year, although retail prices remain slightly better than a year ago.

In the latter part of November the gasoline market became steadier, and prices have been holding generally unchanged for three weeks, giving rise to some encouragement.

Nevertheless, the outlook for the

Average Number of Wells Completed Daily
(By Months, January 1933—November 1937)



Demand and Inventory Situation

(Figures, indicating barrels, are from Bureau of Mines.)

ITEM	FIRST 9 MONTHS 1936	FIRST 9 MONTHS 1937	FIRST 9 MONTHS Change This Year	SEPTEMBER 1936	SEPTEMBER 1937	SEPTEMBER Change This Year
Demand:						
All Oils	897,584,000	997,552,000	+11.1%	109,661,000	120,444,000	+ 9.8%
Gasoline, Domestic	358,026,000	391,276,000	+ 9.3%	44,346,000	47,245,000	+ 6.6%
Gas and Fuel Oil, Domestic	69,459,000	80,763,000	+16.3%	8,238,000	9,482,000	+15.1%
Stocks, End of Month:						
Crude Oil	.....	.....	.....	295,693,000	309,742,000	+ 4.8%
Refined Oils	.....	.....	.....	231,842,000	242,819,000	+ 4.7%
Natural Gasoline	.....	.....	.....	4,945,000	6,278,000	+26.5%
All Oils, Total	.....	.....	.....	532,480,000	558,839,000	+ 4.9%
All Oils, Day's Supply	.....	.....	.....	146	139	— 5.0%

Changes in Stocks Since End of September

(Crude stocks figures from Bureau of Mines weekly reports; others from American Petroleum Institute weekly reports.)

DATE	Crude Oil (Barrels)	Gasoline (Barrels)	Gas and Fuel Oil (Barrels)
October 2, 1937	309,036,000	65,266,000	117,076,000
October 30, 1937	307,140,000	66,836,000	121,070,000
November 27, 1937	304,156,000	68,544,000	121,616,000
December 4, 1937	.....	70,193,000	121,329,000
December 4, 1936	*288,630,000	57,696,000	110,287,000
Change in past year	+54.%	+21.7%	+10.0%

* Stocks November 28, 1936.

gasoline market remains obscure, and continued unsteadiness is indicated, in view of the large gasoline inventories and the usual fall and winter difficulty of holding down gasoline production properly while at the same time maintaining active plant operations in fulfilling heavy demand for fuel oil for heating homes.

Meanwhile, however, the gasoline market is being bolstered by the prevailing strict control of crude oil production and the resultant resistance of crude prices to threatened reductions. It is indicated that crude prices will hold at present levels at least until the end of the year, since strict production control is scheduled for December. Subsequently, the crude market will depend largely on crude control; and thus gasoline prices, similarly, will be affected materially by the regulation of crude production.

Crude Control Effective

The over-all success that the oil industry has had so far in maintaining relatively stable markets undoubtedly has been based, in fact, largely upon the exceptionally effective control of crude oil production.

In November, as in October and September, crude oil production was held somewhat below current market requirements, making it possible for the industry to take some crude out of storage. Furthermore, an additional withdrawal from crude storage is indicated for December, under the strict allowables of the leading producing states.

Crude Stocks Declining

For the final four months of 1937, crude oil storage probably will show a net decrease of over 10,000,000 barrels. That decline would cancel a considerable part of the 20,000,000-barrel addition that was made in the early months of this year.

The effective control of crude production has kept the industry in an unusually favorable situation regarding crude oil inventories. Despite the additions to crude stocks in the spring and summer, the present inventories are only about 5 percent greater than those held at this time last year. This small increase has been more than justified by the 9.8 percent increase in petroleum demand this year over last year. And in terms of days' supply at prevailing rates of consumption, the present crude oil inventories are smaller than those of a year ago.

Drilling and Production in November, 1937, and in First 11 Months of 1937 and 1936

STATE OR DISTRICT	*NOVEMBER, 1937, COMPLETIONS AND CRUDE OIL PRODUCTION: Total Wells	Oil	Gas	Dry	Initial Production	Production for Nov.	COMPLETIONS AND PRODUCTION IN FIRST 11 MONTHS, 1937 AND 1936: WELLS COMPLETED 1937: 11 Mo.	1936: 11 Mo.	Percent Change	DETAILS OF 1937 PRODUCTION: Oil	Gas	Dry	Initial Production	BARRELS PRODUCTION 1937: 11 Mo.	1936: 11 Mo.	Percent Change
Arkansas	23	20	....	3	11,667	1,368,650	122	83	+ 47	69	2	51	38,449	10,721,000	9,806,800	+ 9
California	131	111	4	16	61,481	21,150,900	1,385	1,051	+ 32	1,078	19	288	586,953	216,526,800	196,732,509	+10
Colorado	2	....	....	2	.....	127,050	18	18	.....	3	1	14	2,546	1,434,200	1,529,150	— 6
Eastern States	545	212	183	150	28,661	4,045,550	3,444	2,767	+ 24	1,165	1,382	897	90,743	41,066,750	36,456,000	+13
Kansas	299	226	14	59	294,103	5,412,750	2,489	1,546	+ 61	1,806	114	569	2,337,550	62,963,250	51,334,350	+23
Louisiana	112	65	14	33	34,028	7,236,200	909	915	— 0.6	579	97	233	281,945	83,680,800	73,127,600	+14
North Louisiana	59	36	13	10	20,100	2,175,800	463	521	— 11	301	83	79	141,254	26,276,050	24,231,450	+ 8
South Louisiana	53	29	1	23	13,928	5,060,400	446	394	+ 13	278	14	154	140,691	57,404,750	48,896,150	+17
Michigan	87	63	2	22	16,030	1,655,550	875	709	+ 23	575	61	239	243,685	14,585,550	11,227,650	+30
Montana	21	14	4	3	1,030	473,000	192	178	+ 8	142	20	30	11,904	5,581,950	5,140,750	+ 9
New Mexico	57	52	1	4	38,362	3,140,650	635	521	+ 22	573	26	36	771,609	35,728,750	23,857,650	+50
Oklahoma	248	171	13	64	61,295	17,163,200	2,739	2,633	+ 4	1,942	124	673	1,918,062	206,813,200	182,598,000	+13
Southeastern States	4	....	....	4	.....	.....	17	12	+ 42	.....	.....	17	.....	.....	.....	....
Alabama	1	....	....	1	.....	.....	2	2	.....	.....	.....	2	.....	.....	.....	....
Florida	....	....	....	....	.....	.....	1	2	— 50	.....	.....	1	.....	.....	.....	....
Mississippi	3	....	....	3	.....	.....	14	8	+ 75	.....	.....	14	.....	.....	.....	....
Texas	1,448	1,166	54	223	1,980,802	41,723,950	13,810	11,516	+ 20	10,691	411	2,798	16,273,574	469,618,400	383,396,900	+24
East Texas Field	285	280	....	5	1,477,237	13,838,900	2,251	2,456	— 8	2,174	2	75	10,812,706	154,833,850	136,496,430	+13
Rest of East Texas	96	80	4	12	51,552	3,145,800	957	480	+ 99	817	34	106	508,284	38,796,750	28,936,020	+34
North Texas	195	124	3	68	35,275	2,191,100	2,116	2,004	+ 6	1,162	25	929	233,075	23,847,300	20,040,100	+19
South Texas	343	247	23	73	105,197	7,416,100	3,364	3,067	+ 10	2,369	123	872	949,529	†79,147,500	†30,550,800	+36
Texas Gulf Coast	139	114	4	21	52,262	5,965,700	1,422	1,047	+ 36	1,084	61	277	460,517	†67,932,750	†77,508,400	
Texas Panhandle	95	81	12	2	39,396	2,154,400	742	602	+ 23	575	139	28	285,396	25,598,500	20,537,600	+24
West Texas	268	231	1	36	219,263	5,986,000	2,679	1,424	+ 88	2,342	11	326	3,062,251	68,336,500	57,363,950	+19
West Central Texas	27	9	7	11	420	1,025,950	374	436	— 14	159	28	187	11,212	11,125,250	8,963,600	+24
Wyoming	9	5	3	1	2,241	1,650,150	95	86	+ 10	58	10	27	44,384	17,947,800	12,799,950	+40
Total United States	2,986	2,105	292	589	2,529,700	105,147,600	26,825	22,035	+21.7	18,672	2,279	5,874	22,640,800	1,166,668,450	985,007,309	+18.4

* November completions cover not the calendar month, but the five weeks, or 35 days, ended November 27.
† Fields of Corpus Christi district, now included with South Texas, were shown in Texas Gulf Coast in 1936.

Checking Flange Leaks In Discharge Line

By M. T. PATE

A BATTERY of 4 duplex double-acting 5 x 24-inch plunger pumps, direct-driven through reduction gears by vertical Diesels, was designed to handle a 29° Baume crude under a working pressure of 700 pounds per square inch, and at a speed of 35 strokes per minute.

As installed, these 4 pumps were tied in to the main 8-inch line with 6-inch discharge lines, ranging in length from 165 feet on No. 1 pump to 198.5 feet on No. 4 unit. A suction manifold was included in the station design, but no provision made for manifolding the discharge.

Almost from the start, trouble was experienced in the 6-inch lines, which of all welded construction save for a pair of flanged joints within the station to permit the discharge to offset the suction lines, failed in welds, and around the covers of check valves and at the flanges themselves. The addition of a second bead atop those made at time of welding the lines strengthened this former weakness, and only at the flanges, shown in plan as "A" and "B", Figure 1, did the trouble persist.

Of the usual type, with eight 7/8-inch bolts and with but flat faces, the flanges were welded to the line pipe, and maintained adequate strength and tightness there. The gaskets were hard to maintain, and unless the bolt circle was gone over with a wrench at least once a week and all slack taken up, there was enough leakage to be evident in the pipe pit, with gasket failure if the condition went unattended. After spot-facing a shallow cup in both head and threaded end of bolts in both flanges, a sensitive dial indicator was clamped on first one and then another of the bolts. The elongation under pump plunger impulse was astonishing in its extent. With full line pressure being maintained the elongation on the flange bolts at No. 4 unit, that having the longest discharge stub before the stream entered the 8-inch main, many dial readings were checked as high as 0.0007 per impulse. Translated into alternated stresses per working day, with the pump making 34.5 strokes per minute and accounting all 4 plunger impulses as of equal value, it is apparent that each bolt was stretched 198,710 times each 24 hours, and must return of its own elasticity to its normal length an equal number of times—or else leakage must occur.

Since each ell in the line accounted for a 90° change in direction of flow, it is evident that, if only average line pressure be considered, there is a force of approximately 10 tons tending to elongate the flange bolts or pull the flanges apart. That the theoretical average pressure in the line, as indicated by recording and individual pump gauges, is far from the actual maximum imposed on the line by resonance in the liquid system and impact of the various pump plungers as each takes up its pumping duty is evident from the curve in Figure 2, based on results obtained with indicators equipped with 600-pound springs and attached to the pump discharge line so as to record pressure variation in time with the pump cycle.[1]

That the crude oil handled by this pump does not flow into the 8-inch main with uniform flow or pressure is evident from the swing from minimum to maximum pressures, the graph showing one complete pump cycle between the two vertical lines. For comparison the theoretical discharge pressure from this pump is shown between the two upright lines, taking the form of four rather flat arcs, and showing a maximum low to high swing of only 58 pounds—as contrasted to the 700 actually present and caught by the recording device of the indicator.

Having definitely established the fact that the flange

[1] See "Occurrence and Elimination of Surge . . . in Discharge Lines," Proc. A.S.M.E.

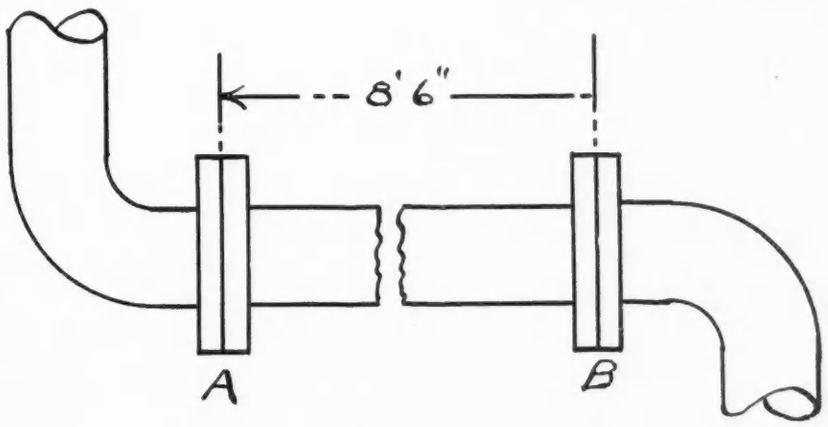


FIGURE 1

Layout of troublesome flange joints. (Not drawn to scale)

bolts are elongated with each plunger impulse, and evaluating the pressure variation (maximum effect) as 20,649 pounds per stroke cycle it is evident that the gasket material used in the flanges at "A" and "B" is subjected to a rapid and severe kneading action 138 times per minute, or slightly more than twice per each second. By reference to Figure 3 this becomes apparent. The gasket, of rectangular cross-section, is alternately compressed by the inner surfaces of flange faces, this compressing force acting in the direction of the arrows "F" on each face. This takes place with each pressure drop as shown on the curve in Figure 2.

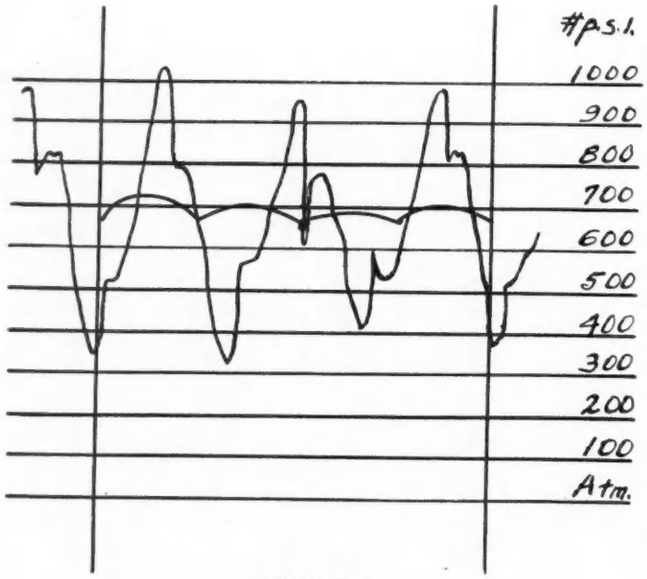


FIGURE 2

Combined indicator cards from discharge line of crude oil pump, showing wide range of pressures

Then, as the plunger takes up its load, the pressure within the line elongates the flange bolts, and there is a microscopic gap opened between gasket and flanges, shown exaggerated as "L" in the sketch. At the same time, line pressure, acting against the inner or fluid edge of the gasket at "P", tends to force the gasket laterally through the annular space between flanges, this motion being resisted by the interlocking of gasket material fibres with the comparatively rough faces of the flanges. Pressure "P" also tends to upset or broom out the inner edge of the gasket into the ends of the annular spaces "L", subjecting the inside edge to a rapid spreading and squeezing action which eventually causes disintegration of the material, with consequent gasket blowout.

The use of a material with low inherent elasticity, such as lead—either as sheet or lead wool—requires almost constant tightening of the flange bolts to take up the thinning of the material under the minute but repeated impacts of the flanges under pipe line conditions. This explained why, in the original setup, the gasket at "A" showed oil long before the one at "B". The joint at "B" was sealed with a composition ring as furnished by the flange manufacturer, while that at "A", though not as near the second ell and thus not exposed to as great shock, was of lead; this material rapidly hammering out and permitting oil to escape through the spaces at "L".

An interesting by-product of these tests was that long before a gasket deteriorates sufficiently to permit actual flow to take place through or around it, the alternating stress imposed on the flange bolts initiates a pumping action through the spaces "L" which results in a minute showing of oil at the outer edge of the gasket. With such a material as lead or sheet copper in the joint, the comparatively nonresilient gasket does not follow the flange faces and preserve a tight seal, but instead leaves the slight space into which, during the fraction of a second the pressure is at its peak, oil is forced.

With the next reduction in line pressure, corresponding to any of the low spots as shown in the indicator diagram in Figure 2, the flange faces again closely contact the gasket, and the droplet of oil in the space "L" is flattened in all directions. Since pressure at side "P" is less than that at the outside of the gasket at the bolt circle, the spread of this droplet is greatest toward the outside, becoming visible when the action is often enough duplicated to show a stain of oil between flanges.

That this appearance of oil is not due to direct flow through the space between gasket and flange face is easily demonstrated by arranging to draw a thread across the flange face against the edge of the gasket, hooking the thread to the actuating string of the indicator and checking the appearance of the oil stains against position of pump plunger on the stroke cycle.

Adequate air chambers on these discharge lines greatly cut down the amplitude of the pressure range in each of the pump discharge lines, while the scrapping of all metal gaskets or flange joint rings for a good grade of oil-resistant plastic material cut down to a minimum the trouble at the only two possible leakage spots in each of the discharge lines.

Following the replacement of metal joint seals in the discharge lines at all flanges, plastic gaskets were used on checks, gate bodies, and other separable points, where only infrequent or no inspections are normally made to insure tightness.

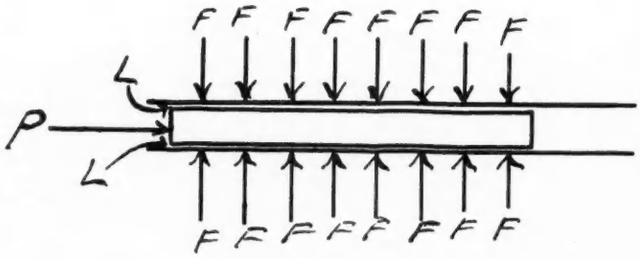


FIGURE 3

Diagrammatic representation of forces acting to hammer gasket and cause oil leaks

Although aware that such is not standard practice, the writer favors cutting the gaskets so that their inside diameter will be from ⅛ to ¼-inch less than the inner diameter of the flanges. Of the more than 100 gaskets so installed, and subsequently inspected, there has been no instance of such a gasket tending to cut out on the inside edge; indicating that the slight lip of material protruding acts to check the entrance of oil between flange faces and gasket by spreading to serve as seal across the flanges, even when spread apart under maximum pressure impulse, as indicated by the dial gauge and bolt elongation.

Acid Treatment Technique

DEVELOPED IN TEXAS PANHANDLE

Increases Gas Well Volumes

By FRANK B. TAYLOR, Staff Writer

USE OF ACID in increasing productivity of natural gas wells is not new. Lime areas of Kentucky under repressuring or gas drive have been advantageously treated to increase the porosity of formation adjacent the hole. Limy shales in Pennsylvania have been treated. But for a number of reasons acid treatment of lime formations to stimulate natural gas recovery has not become widespread.

The fact that a dependable method of treatment has been developed within recent months, and that it has been found practical in the Texas Panhandle, is particularly significant and effective in establishing open flow potentials far exceeding in many cases the gauges resulting from routine completion.

That the present work denotes an important trend in lime-gas wells is an inevitable conclusion.

Process Has Limitations

Although the results of the treatments in the Panhandle have been distinctly successful, considered as a whole, certain individual cases have indicated strict limitation of the process. It is illogical to reason that any lime-gas well may be treated to increase production. The disregard of this consideration was responsible for much of the early discouragement in efforts to treat gas wells.

In the Texas Panhandle sector the first use of acid was to increase crude production from wells into the brown dolomite. Results varied and the practice was not widely applied. Shooting has been used successfully in all six producing formations, with the exception of the Granite Wash, this being naturally of sufficient porosity for near capacity production. In a number of instances both methods of stimulation were used as complements to each other, introduction of acid following the use of a shot.

Early Efforts

First efforts to apply acid to gas wells in the sector involved the use of a single charge of fluid. Following introduction into the formation, the well was allowed to stand for a time judged to be sufficient for the reaction to go to completion. It then was opened and allowed to clean itself. A retaken open flow gauge was used as a yardstick to determine the success or failure of the work.

In many cases the productivity of a gas well following such treatment was actually less than the production of the well prior to treatment. In only a few cases were satisfactory increases obtained. From the economic angle, the results were discouraging. Quantities of acid used in the early tests ranged from as little as 250 gallons to 5,000 gallons per charge.

It was evident that a blocking action resulted from the early applications. Also, from later testing, it was determined that to allow the chemical reaction to go to completion was dangerous as the resulting precipitate would seriously clog much of the pore space. In narrow vents into the producing zone, such hindrance to normal passage of gas, very probably supplemented by the filling of fine pores with resultant mud carbonate, materially reduced productive volumes. With rock pressures usually below 400 pounds per square inch and volumes lower than average in the treated wells, it was not possible to clean the wells thoroughly following such injury by the ordinary method of venting to atmospheric pressure.

A Distinct Improvement

Exhaustive study of the effects and probable effects of the single treatments used in the early attempts to acidize gas wells led to the conclusion that multi-stage introduction was required and that the reaction of the acid and lime to chloride salt should not be allowed to go to completion. To prevent the latter, the spent acid is now removed from the well before it has become completely neutral. This allows the activated fluid to attempt to complete its reaction as it is being exhausted from the well. This results in a cleansing of the pores and vents of the lime body subjected to the live acid as introduced, and leaves a minimum of clogging material in the productive zone.

In addition to the actual treatment at the well, it is now almost a rule to subject a sample of the formation to be treated to a laboratory test to determine solubility in the acid to be used. This allows the engineer to form a fairly accurate estimate as to the probable success of the treatment and the time required for the acid to react with the strata producing. In some cases such tests disclosed the inadvisability of treating through the finding of an almost negative reaction toward samples.

Modern Equipment Helps

Modern equipment allows exact control over the acid introduced. A fluid or gas load over the treat-

Nipple for open flow gauging of well is screwed into the casing head and the well opened. A goose neck of the small tubing faces the gas stream as the well produces. The energy exerted is applied to a mercury column graduated in millimeters. The deviation from static determines the volume of gas the well is producing. Gauger F. McPeters ready to take reading.

ment, either introduced by compressors or pumps, or through lubricating into the well, forces the charges into the formation. Measurement of well depth and the blocking of exceedingly porous formations increase the control of the application and tend to aid in centralizing the zone of treatment. New and added energy, either chemical or physical, is being used to intensify and speed up reaction of the acid. Intensification has been found particularly desirable in treatments of dolomite or dolomitic lime, either of which is considerably less soluble in normal acid than is lime.

No Established Procedure

Experience of production men in the area has not led to an established procedure in the number of stages or in the quantities used. One firm uses a three-stage treatment almost exclusively. Another uses a two-stage, 5,000-gallon treatment, usually following a shot. An earlier shot is frequently used in the brown dolomite, a formation not very susceptible to acid. The volume of gas produced in a newly completed test does not hold as a determining factor in treating.

Treatments have been used in both the sweet and sour gas areas with equal results. Approximately 80 wells have been subjected to acid, with the number of treatments on recent completions steadily increasing. Moore County production, which is largely from the white lime, has shown exceptional increases in cases where acid reaction proved to be highly effective. Increases of 300 percent are not uncommon. Experiments are still being carried on in all sectors of the Panhandle to further increase the effectiveness of treatments, both as to formation and as to methods used.

Specific Application

A gas well drilled just north of the southern line of Moore County in proven sweet gas territory was initially gauged for approximately 6,300,000 cubic feet after all the lime section had been drilled. Pay was topped at 2130 feet, and was found to consist chiefly of laminated lime and dolomite with the dolomite predominating. Granite wash was picked up at 2200 feet. This material and igneous rock was drilled to virgin granite at 2230 feet. Four feet in the granite the drill entered a crevice containing a very small volume of gas. This peculiar condition is recognized as existing in the Granite Ridge area of the Panhandle, and has been satisfactorily accounted for by geologists of the region.

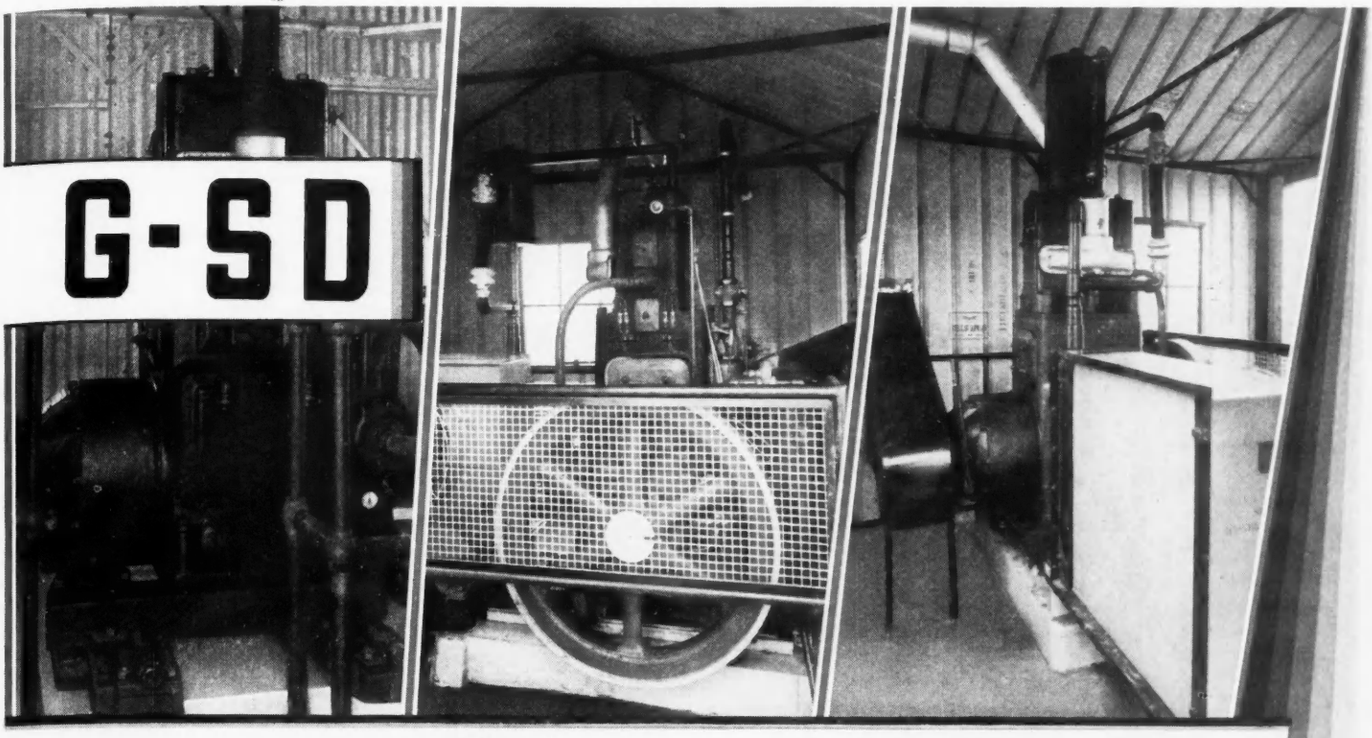
As there was very little chance of increasing the flow by deepening, the hole was stopped after going crooked in the granite crevice. The bottom of the hole was in a highly porous or open formation that would receive an undetermined fluid volume. Consequently, a jell preparation was introduced into the granite, the granite wash and up the hole to the zone to be treated. This prevented loss of acid into the thief strata and centralized the charge to the zone of reaction as the granite would in no way react with the acid even although the two were in contact.

First Charge

A three-stage treatment was used in the manner found most suited to Panhandle conditions. The first charge was 1000 gallons. Reaction of the first or primary charge is to clean the face of the producing formation and open up vents into the strata so that following charges will be more efficient in action. In many cases, even when the completed treatment is entirely satisfactory, the first stage may somewhat reduce the open flow volume. In this particular case, the first charge was allowed to set one hour; then it was blown from the hole. A check showed that the gas volume had been increased to 12,500,000 cubic feet, closely paralleling an arbitrarily established 100 percent increase per treatment stage.

Second Charge

A second charge of 3000 gallons was introduced into the formation and allowed to set for 5 hours. The well was then blown down for 5 hours to clean it of all acid and resultant sludge. A shut in period of 22 hours allowed the well to return to a nearly



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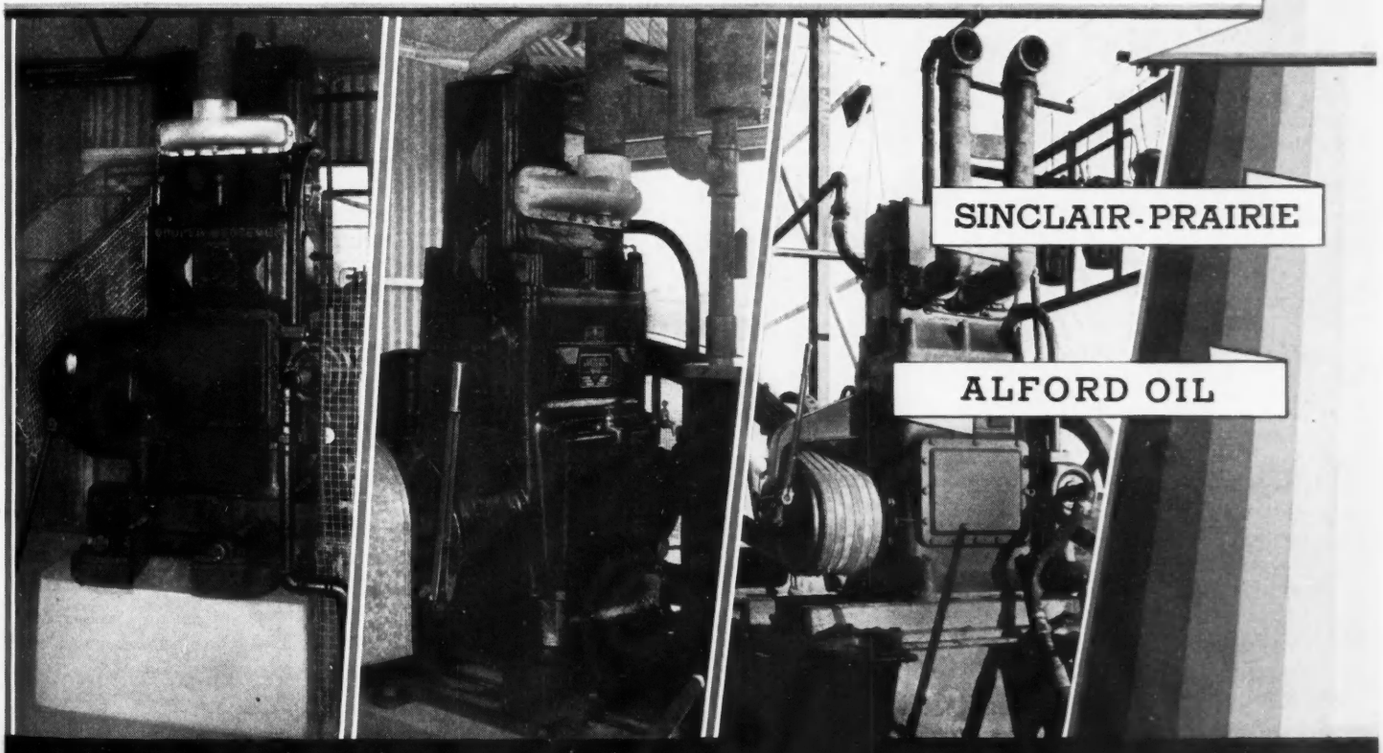

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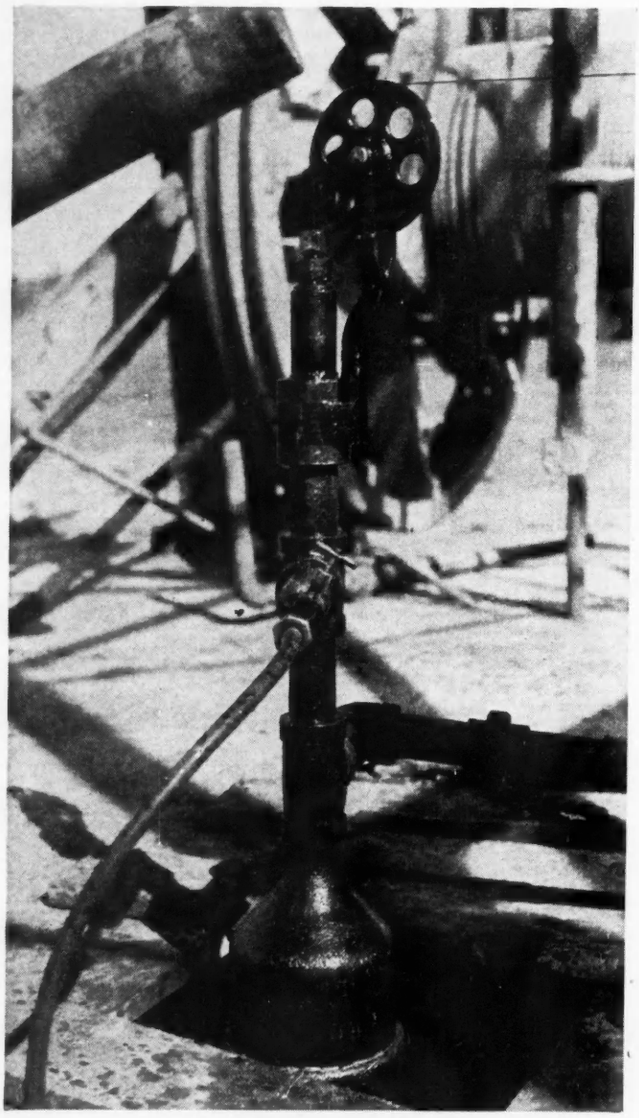

Well head during the introduction of acid. The wire line is attached to a float riding on the top of the acid column. The line at the lower right is that used for the introduction of the treatment. The high pressure hose in the foreground leads to a recording pressure gauge showing the variation in well head pressure as the treatment is pumped into the well.

normal condition, and a gauge showed that the open flow had increased to 27,500,000 cubic feet.

Third Charge

A third charge of 6000 gallons was introduced into the well and allowed to set. Following cleaning of the well, the open flow had again increased to a new total of approximately 36,500,000 cubic feet. Gauges taken immediately following the return of a well to normal rock pressure usually rise slightly during the first week following acid treatment. This is believed to be due to further reaction of a small amount of acid remaining in the strata, and possibly to more complete cleaning of the formation itself during blowing of the well for a gauge.

In all, 10,000 gallons of acid were used in the treatment in the customary three stages of 1000, 3000 and 6000 gallons. The production was increased from an initial of 6,300,000 cubic feet to approximately 36,500,000 cubic feet. This well reacted along anticipated lines, except that the last treatment did not result in the increase normally to be expected. Even so, the open flow volume was increased about 500 percent above the initial gauge.

Two-Stage Treatment Applied

The two-stage treatment, in which an initial charge of 1000 gallons is followed by 4000 gallons, is popular and has proven practical. These may either be applied following a preparatory shot of explosive, or may be introduced under normal conditions. As expected, results vary greatly from one well to another in the same formation and in the same general vicinity. Also, as the Texas Panhandle gas area extends over an area exceeding one million acres, it is natural that different sectors of the field present different problems to the gas producer.

In some sectors normal completion of wells accounts for daily gauge yields above 50,000,000 cubic feet. In a few limited sections, wells with initials above 130,000,000 cubic feet are of record, and in other areas, wells seldom exceed 8,000,000 cubic feet. Consequently, the initial gauge of a gas well is no criterion as to the prognosis following treatment. Local conditions must be the determining factors, the most important of which is the characteristic of the strata.

The following described completed wells in the gas area are random locations at which treatment in various manners and degrees brought about the results as indicated. In addition to quarts of glycerin and the acid of the application, it is frequently necessary to make use of sealing compounds in varying amounts. One firm holding extensive acreage and wells in the gas area customarily drills through the lime pay and on into the granite wash to pick up whatever gas it might contain. In some instances the latter volume is high, and in many cases the wash is without appreciable gas content. In any case, it is generally necessary, following penetration of the wash, to seal off this strata, which usually acts as a thief to the acid. The use of sealing material is indicated in some of the following:

WELL NO. 1

Application Procedure

1. Shot with 310 quarts after completion.
2. 1000 gallons acid with gas drive into strata—Set one hour and vented.
3. 4000 gallons acid, gas drive, set three hours and vented.

Tests

1. Initial gas .....15,000,000 cubic feet
2. After shot .....25,000,000 cubic feet
3. After two treatments, 1000 and 4000 gallons.. Final test .....45,000,000 cubic feet

WELL NO. 2

Application Procedure

1. 15 gallons jelly seal on bottom.
2. 1000 gallons acid, gas drive, set hour.
3. 4000 gallons, set and vented.
4. Shot with 290 qts. after treatment.

Tests

1. Initial gas .....10,800,000 cubic feet
2. After acid .....18,000,000 cubic feet
3. After shot .....22,000,000 cubic feet

WELL NO. 3

Application Procedure

1. Shot with 290 qts. after completion.
2. 1000 gallons acid, set hour and half.
3. 4000 gallons acid, set and vented.

Tests

1. Initial gas .....14,000,000 cubic feet
2. After shot .....26,000,000 cubic feet
3. After 5000 gallons acid.....50,000,000 cubic feet

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WELL NO. 4
Application Procedure

1. Shot with 290 qts. after completion.
2. 25 gallons sealing compound on bottom.
3. 1000 gallons acid, set hour, and vented.
4. 3000 gallons acid, set 5 hours, and vented.
5. 6000 gallons acid, set 5 hours, and vented.

Tests

1. Initial gas ..... 7,000,000 cubic feet
2. Following shot .....11,000,000 cubic feet
3. After 1000 gallons acid.....
4. Final test .....33,000,000 cubic feet

WELL NO. 5
Application Procedure

1. 1000 gallons acid, gas drive, set 2 hours and vented.
2. 4000 gallons acid, gas drive, set 8 hours, vented.

Tests

1. Initial gas .....30,000,000 cubic feet
2. After two stage acid.....47,000,000 cubic feet

WELL NO. 6
Application Procedure

1. 25 gallons jelly seal on bottom.
2. 1000 gallons acid, gas drive, set hour and vented.
3. 4000 gallons acid, set 5 hours, vented.

Tests

1. Initial gas .....32,000,000 cubic feet
2. After 5000 acid.....81,000,000 cubic feet

WELL NO. 7
Application Procedure

1. 25 gallons sealing compound on bottom.
2. 1000 gallons acid set hour, vented.
3. 4000 gallons acid, set 5 hours, vented.

Tests

1. Initial gas .....37,000,000 cubic feet
2. Final gauge .....75,000 cubic feet

WELL NO. 8
Application Procedure

1. 15 gallons compound on bottom.
2. 1000 gallons acid set hour and vented 45 minutes.
3. 3000 gallons acid, set 4 hours, vented.
4. 6000 gallons acid, set 8 hours, vented 10 hours.

Tests

1. Initial gas .....28,000,000 cubic feet
2. After 4000 acid .....37,500,000 cubic feet
3. Final open flow gauge.....62,000,000 cubic feet

WELL NO. 9
Application Procedure

1. 40 gallons sealing compound on bottom.
2. 1000 gallons acid, set hour and vented.
3. 4000 gallons acid, set 4 hours, vented.

Tests

1. Initial gas .....40,000,000 cubic feet
2. After 1000 gallons acid.....48,000,000 cubic feet
3. After treatment complete .....72,000,000 cubic feet

Increased 157 Percent

The group of stimulated increases to original open flow gauges of the wells above shows that an average increase of 157 percent over and above the initial gauge was obtained. The greatest increase of any one well was 370 percent; the lowest, 70 percent. These extremes show the uncertainty of the result in relation to initials. A digest of the results of treatment also shows that the initial volume apparently has little effect upon the success of the work, although it seems evident that the treatment of wells having exceptionally large initial gauges decreases in practical application as the volume of production approaches the critical flow rate of casing with normal rock pressure to working pressure drop.

One logical practice is adhered to with very few exceptions. This is the sequence of shooting and acid, in which the shot is first used. Experience has proven that acid on lime measurably increases porosity. This increase in special volume tends to reduce concussion of the shot and to dampen the force of the explosion. For this reason it is common to use the shot prior to the acid. In cases where later shots were found to be particularly effective, it is general that the acid was not as effective as was expected, and consequently the porosity of the lime was not greatly increased through prior treatment.

Specific Aspects

In making the acid introduction into the lime formations it is necessary to shove the treatment into the strata by applying a driving pressure. The bottom-hole pressure under such conditions is equal to the fluid head of acid (15-percent by weight), this being approximately one pound for each two feet of hole, plus the rock pressure and lubricating (shoving) pressure. In the first application it is often necessary to use pressures between 200 and 400 pounds above rock pressure to obtain sufficient penetration into the strata body to obtain a reaction with the drilling fluid held by the formation and with the rock paste resulting from the drilling. Subsequent loads of acid may require less driving power, depending upon the volume of the treatment, opened porosity and extent of penetration.

Pressure above an acid load is applied by compressors, boosting gas into the casing head. The acid level is known through a floating weight at the end of a measuring line. Both the top of the acid and the rate and volume of input are determined in this manner. Pressure necessary to force a charge into a well having a low initial production is generally greater than in a well having a comparatively high initial open flow. This is because the producing strata is of low permeability in poor wells, high permeability in good wells, consequently, the resistance to acid injection is inversely proportionate to the permeability, and hence to initial production.

The question is raised as to the sustained production of wells treated to increase production. Investigation does not disclose any unnatural drop in production rates, even in wells that have been produced at high rates to supply gasoline and carbon plants. The evidence favors the theory that no swift or unaccountable depletion of the well will result. It seems reasonable to assume that the treatment effectively reduces the resistance offered gas traveling through the producing zone of the well to the production string, this lessening of resistance being entirely responsible for the increase in volume. As a result, there is no agent present that might promote early depletion.

It is true that over an extended period the gas might be exhausted at an earlier date, but the total volume of gas obtained from the well should be somewhat greater than if the well had not been acidized, the greater per-day flowing rate accounting for the more rapid exhaustion.

Since the beginning of treating practice in the Texas Panhandle, definite strides have been made in methods of application as well as in the agents employed. Many wells have been treated and almost all of them are cases for study. Conclusions are strongly in favor of treatment where needed and where strata conditions are favorable. After all, an expenditure of $2,000 toward the stimulation of a moderate well that apparently is susceptible to treatment is far less a gamble than was the drilling of the well in the first place.

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TRIPLEX HOOKS

Water-Flooding of Oil Sands

By PAUL D. TORREY, Geologist,
The Sloan & Zook Company

PART 3

Development of Water-Flood Properties

VARIOUS geometric patterns have been used in the intensive development of water-flood properties. (See Figure 1*). The most common pattern is rectangular (the five-spot), with an oil well located in the center of a square formed by four water intake wells. This pattern is, in reality, nothing more than a continuous series of line floods, and it was therefore the natural change from the system of flooding most widely in use prior to the more general introduction of intensive development of properties. Its use, in the Bradford and Allegany fields, has been almost universal, owing to the ease with which it is fitted into property boundaries and the manner in which the distance between the wells can be varied to conform to changing conditions in the sand body.

A triangular pattern (the four-spot) has been used on a few properties. In this system an oil well is located at the center of an equilateral triangle formed by three water intake wells at the corners. It is claimed by the operators using this pattern that it will add materially to the effectiveness of the flood, but comparative data based upon actual operating results are not available to the writer. From a theoretical standpoint, it is somewhat questionable whether the possible increase in anticipated recovery will be sufficient to warrant the additional expense required in the development of a property on the "four-spot" plan. The triangular pattern alone is very difficult to fit into property lines, but on properties possessing irregular dimensions, it may sometimes be used to advantage in connection with a main development using a rectangular pattern.

PART 1 and 2 of this series on water-flooding appeared in The OIL WEEKLY November 29 and December 6 respectively, and discussed the history of the process, geologic factors affecting the successful application, physical and lithologic characteristics of oil producing formations that should be considered.

Remaining parts will discuss drilling practices, surface equipment, operating methods, and application of electric well logging.

An abstract of the paper was presented before the fifth annual meeting of the Illinois Mineral Industries Conference.

Some intensive floods in the Bradford field have been drilled according to a hexagonal pattern (the seven-spot), with an oil well drilled in the center of a hexagon formed by six water intake wells at the corners. The hexagon possesses some very distinct merits, for it is the polygon with the largest number of sides that will fit into a continuous pattern. A hexagonal arrangement of water intake wells will undoubtedly increase the efficiency of a flood, in that the oil well will be more effectively surrounded by advancing banks of water, and the danger of trapping oil between the intake wells will be diminished. The reduction in development cost by the use of a hexagonal pattern will be considerable except where a large number of offset wells must be drilled along the property lines.

In comparing these three patterns, it will be evident that in the four-spot each water well affects six oil wells; in the five-spot each water well affects four oil wells; and, in the seven-spot each water well affects three oil wells. Assuming a constant distance of 200 feet between water intake wells for each pattern, at the time the water has advanced 100 feet away from each intake well and has at this point met the water coming from the opposite intake well, in the four-spot it will be approximately 15 feet away from the oil well; in the five-spot it will be approximately 41 feet from the oil well; and, in the seven-spot it will be approximately 100 feet from the oil well. The danger of by-passing will therefore be greatly reduced in the hexagonal flood, for when the water in any one bed of the sand meets half-way between the intake wells it still has a considerable distance to go before it comes to the oil well, whereas in the triangular pattern when the water meets between the intake wells it has at the same time almost reached the oil well which will then shortly thereafter have to be abandoned on account of the rapid encroachment of water.

Assuming again the same distance of 200 feet between water intake wells, each water intake must flood out 103,800 square feet in the five-spot, and 51,900 square feet in the seven-spot. From this standpoint the relative efficiencies of the five-spot and seven-spot are fairly close, but the four-spot is apparently far less

* Figure 1 appeared on page 21, November 29 issue.

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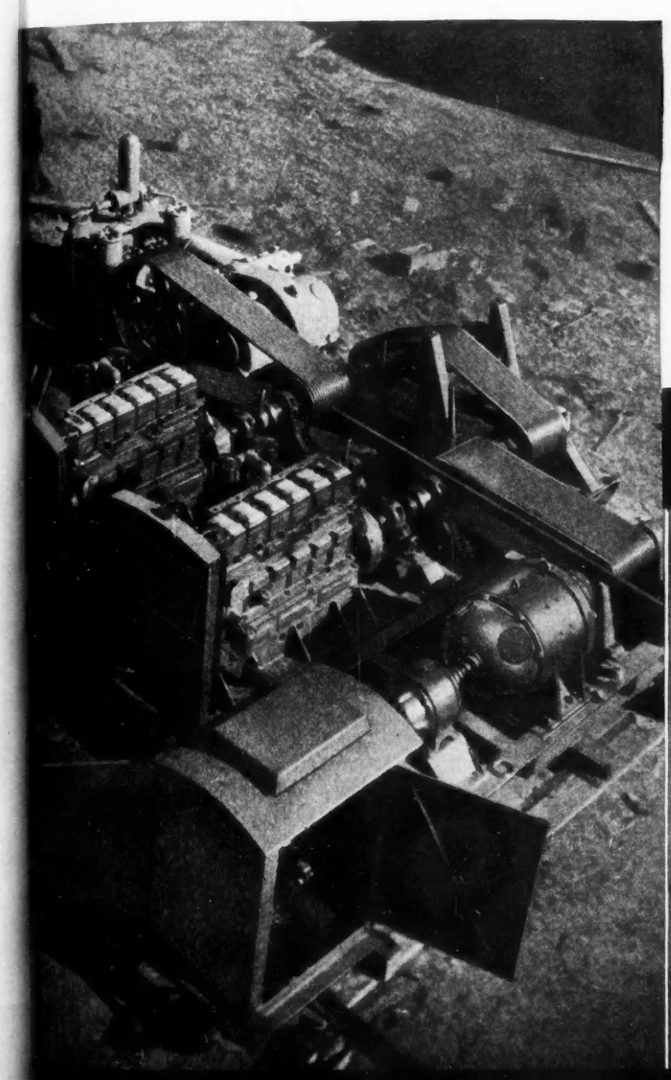

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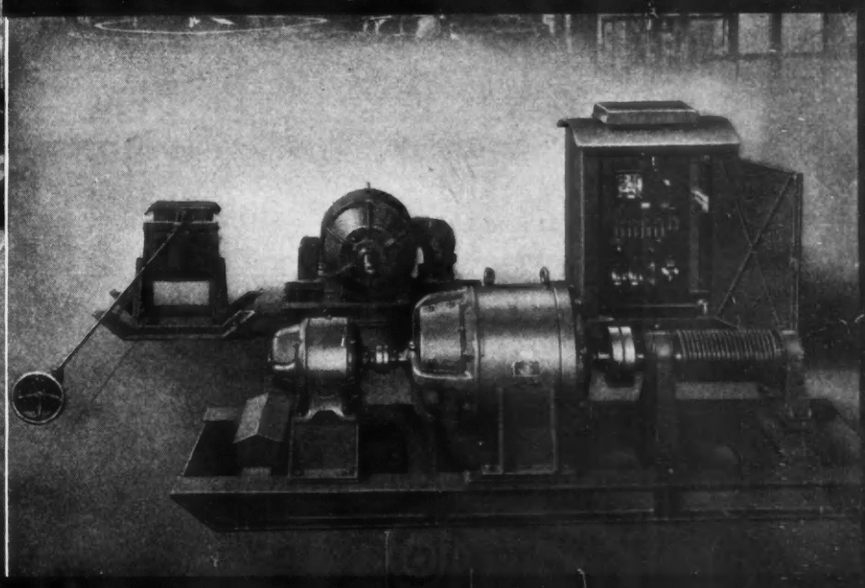
834

Left—Type EM2 Rig being set up on location

Below—Shop view of Electrical Equipment for an EM2 Rig



EQUIPMENT ENGINEERS TO INDUSTRY

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desirable, for it the input of water into each intake well for the three different patterns is constant, it will take a much longer time to deplete the flood-area drilled according to the four-spot pattern.

Probably the most important factor determining the ultimate profits that may be expected from a water-flooding operation is the selection of a well-spacing pattern designed to conform best with the characteristics of the sand body underlying the property. There are many factors that determine the ideal spacing pattern for a property or an area, but in general it can be stated that the spacing of wells should be so planned that the ultimate recovery can be obtained with a low development cost within a reasonable period of time. Some of these factors have been previously mentioned and discussed such as: geometric patterns, sand porosity and permeability, percent saturation, and total oil content of the sand. In addition to these factors, the water pressure applied to the sand and the cost of development must be included.

Determine Oil Content First

The oil content of the sand should be the object of primary interest in the investigation of the water-flooding possibilities of an untested field. Consideration must, of course, be given to the price paid for the oil and the certainty of markets for an increased production. Owing to the higher posted price paid for Pennsylvania grade crude over that paid for Mid-Continent grades, a property in the Pennsylvania grade area may be profitably operated on a much lower oil content and oil recovery than properties in Oklahoma or Kansas, if development costs are approximately equal.

In addition, the valuation of the land must be taken into account. High priced acreage will not only have to produce enough oil to pay for the development cost and operating expense, but it will also have to return the purchase price, and a reasonable profit on the entire investment.

Eliminating the factor of acreage valuation, it can be stated that in the Bradford field the lowest minimum recovery that could be expected to yield a profit would be from 3000 to 3500 barrels per acre, the variation in required recovery being based upon differences in drilling depth throughout the field. To this recovery figure must always be added the amount of oil necessary to carry the cost of the property.

What Property Should Produce

Following this line of thought, and assuming approximately equal development costs, water-flooding in areas of the Mid-Continent region where the sand will not produce a recovery of from 6000 to 7000 barrels per acre would be regarded as being a rather hazardous enterprise.

In this connection it should be noted that development costs in certain of the shallow fields of northeastern Oklahoma are actually less than one third of the average cost in the Bradford field, which will therefore permit a profitable development of properties where the sand will yield a recovery of much less than 6000 barrels per acre. It should, however, be kept in mind that the well-spacing, which is responsible for the greatest part of the development cost, may be adjusted to correspond to the oil content and estimated recovery from the sand, taking into account, of course, that the permeability of the sand is sufficiently high to justify a wide well-spacing pattern. In thick sand areas carrying a high oil content. The wells may be spaced closer than in thin sand areas carrying a low oil content. The quicker return from more closely spaced wells in thick sand areas may fully justify the additional expenditures required for development.

Factors of Selection of Pattern

Selection of a geometric pattern for the well locations will depend largely upon the size and shape of the property. On large properties the hexagonal pattern is favored over the triangle or rectangle for reasons previously presented.

Of all of the factors which must be considered in the selection of the proper well-spacing for a property, the average permeability of the sand is probably of the greatest importance. In tight sand areas, a closer spacing must be used than in looser sand areas to recover the same amount of oil within equal time periods. It is possible that the experience obtained from flooding operations in the Bradford field may not be exactly applicable to other areas, but the curve given in Figure 4 does represent the relation between well-spacing and average sand permeability which has given satisfactory results at Bradford. There are, of course, reasonable limits beyond which this curve cannot be applied. It is presented in order to show the great importance of taking into consideration the permeability of the sand in planning the well-spacing to be used in a flooding operation, and not as a fixed formula that might be applied in any other area. It is believed, however, that some such relationship will be found in every field that is otherwise adapted to water-flooding operations.

The modern system of water-flood-

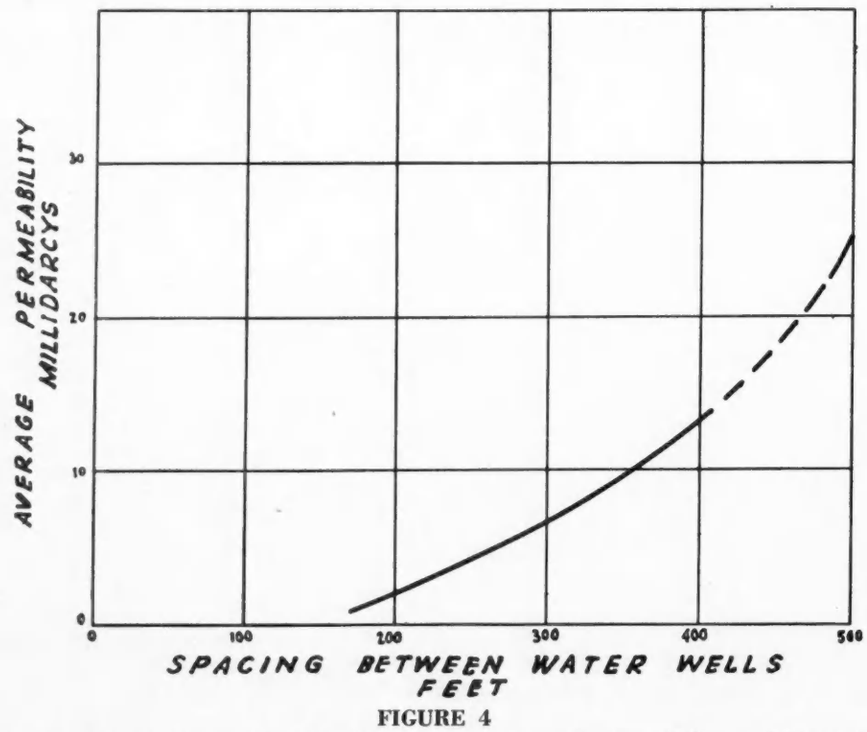

FIGURE 4

Curve showing the relationship between average sand permeability and spacing between water wells which has given satisfactory results from water-flooding in the Bradford field

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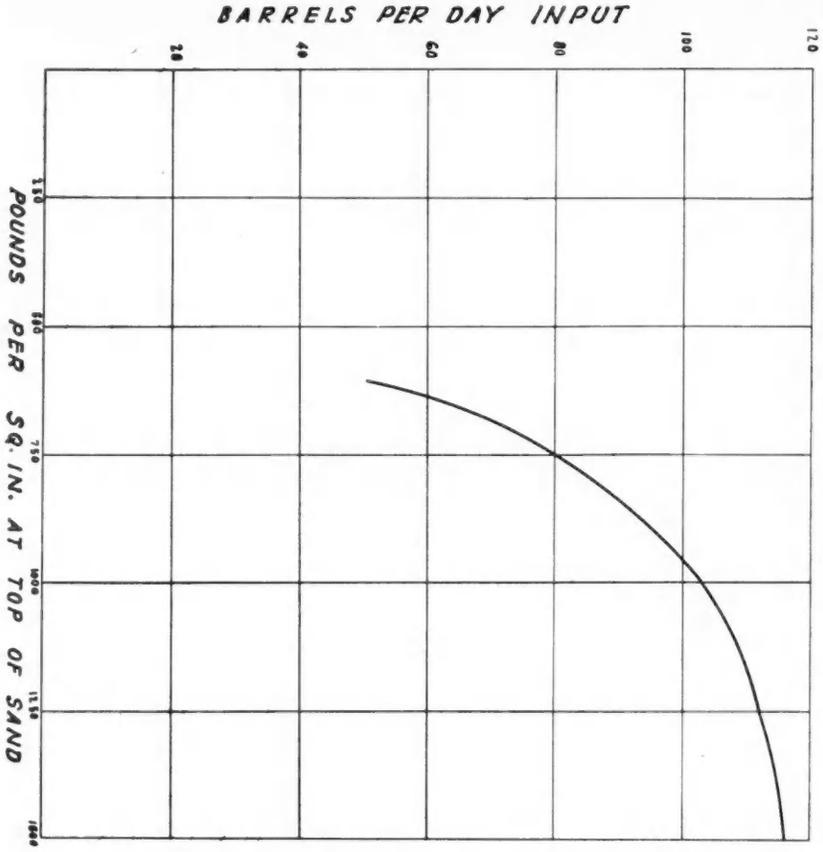

FIGURE 5

Curve showing relationship of pressure at the top of sand to water input for Bradford sand possessing a thickness of 23 feet, an average porosity of 10.95 percent, and an average permeability of 4 millidarcys.

ing involves the use of water under a predetermined pressure which will most effectively deplete the sand within the desired time limit. Increased water pressures may be used in areas where the sand possesses low permeability and thereby enable the use of a wider well-spacing pattern than could be used if only the normal hydrostatic pressure was employed. Increasing the pressure does not increase the water input proportionately, as will be seen from Figure 5. But it does expedite flooding action during its earlier life by further compressing the gas that remains in the sand, and during the later life of the flood by providing somewhat faster fluid movement.

Development Costs

Cost of development of a water-flooding project must be taken into account in the same manner as the property cost or valuation. Development costs are not only dependent upon the well-spacing, but they are also directly proportional to the drilling depth. There are partially depleted fields in West Virginia at the present time producing from the Berea sand which would undoubtedly respond favorably to water-flooding. However, the drilling depth is approximately twice the drilling depth in the Bradford field, which has delayed development up to the present time. With the assurance of a better crude price, these fields will undoubtedly be flooded. The shallow depth of the Bartlesville sand in northeastern Oklahoma and southeastern Kansas has made possible the profitable development of water-flooding operations in these areas, notwithstanding the lower price paid for the crude.

Time Element

Time required to deplete a five-spot or any other type of intensive flood can be predetermined with reasonable accuracy to meet the requirements of the operator, by varying the dimensions of the spacing pattern. A close spacing with normal water pressure will give rapid results, and it is frequently used where it is desired to make a rapid return of the capital invested in land and development, or to build up a large production for the purpose of property sale. A wide spacing pattern possesses the material advantage of lowering the cost of development, and the longer productive life of widely spaced floods permits a better opportunity for obtaining an average price for the oil produced.

In the Bradford field, where sand conditions permit, there has been a gradual but definite trend toward wider spacing patterns. In Figure 6

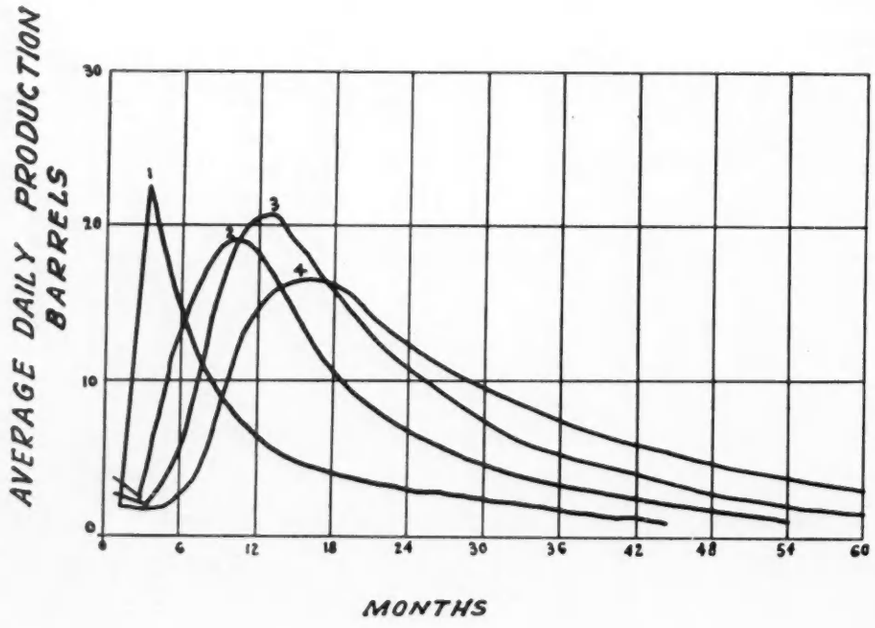

FIGURE 6

Oil production curves from five-spot flood wells of varying spacing pattern. In curve No. 1 the water intake wells are spaced 180 feet apart; Curve No. 2, 250 feet apart; Curve No. 3, 300 feet apart; and Curve No. 4, 350 feet apart.

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the production of typical wells from five-spot floods of different spacing is given. Most intensive floods in the Bradford field have been so spaced that the property will be depleted within an operating period of five to six years.

Water Supply

The requirements of a satisfactory water for flooding operations may be briefly stated: the water must be in ample quantity, and must not cause plugging up or choking of the oil pay. The water used is primarily responsible for the results obtained from water-flooding, and it is therefore very evident that the quality of the water has a most important bearing upon the effectiveness of the flood.

It can be shown in many instances, both in the Bradford field and in northeastern Oklahoma, that the failure of water floods to produce the amount of oil anticipated is directly attributable to the poor quality of water used.

The necessity for an adequate supply of pure water should therefore be very evident, particularly when it is realized that the water requirements for an intensive flood are sometimes in excess of the rainfall over the operated area.

During the earlier period of flooding operations in the Bradford field, the water was introduced into the sand by merely cutting the surface casing in the intake wells and allowing the water to flow down the hole to the top of the sand. Upon the more general adoption of intensive methods of development this method was soon discarded for the reasonss that the water coming from the surface rocks tended to carry mud and silt with it, thereby plugging the sand; because it was found that in many cases the volume of water available was not sufficient for efficient flooding operations; and because it was found in many cases to be most advantageous to apply additional pressure, over and above the normal hydrostatic pressure, to the sand. It was soon realized that the ground water supplies in many parts of the field were not adequate to maintain large scale flooding operations, and the supply has therefore been supplemented by a trunk water pipe line system originating in the nearby Allegheny Valley.

Appreciating that there is not enough ground water available for flooding operations in the Bradford field, which is located in a region which has an average annual rainfall of about 45 inches, it can be readily realized how important it will be to establish ample water resources for contemplated water-flooding operations in fields located in more arid regions.

In many parts of the Mid-Continent region, river water appears to be the only source of supply, but the use of river water will in most instances require the construction of large settling reservoirs to permit the removal of most of the suspended matter and the use of water treating plants.

It has also been suggested that salt water might be used for flooding purposes. This is a possibility, but great care must be used in the introduction of salt water into an oil sand for most oil sands carry certain amounts of precipitated mineral salts which will go into solution with the water introduced up to the limits of their individual solubility product constants. A saturated solution might therefore likely be formed which would tend to lose part of its carried burden of mineral salts by the evaporative effect of expanding gas as the water comes into the producing wells, resulting in the precipitation of a coating of salts on the face of the sand. This action has been known to take place in the eastern fields, and it requires costly periodic cleaning out of the wells in order to maintain production.

Any water purification for flooding purposes involves the removal from the raw water of any substance or property which would tend to make it plug the sand and so impede the constant flow of water. Most ground waters carry a small amount of suspended matter and varying amounts of soluble iron and other mineral salts. Under the old system of water-flooding, where the water did not come in contact with the atmosphere, plugging action by chemical precipitation probably was not a very serious problem. However, with the adoption of intensive methods of development, resulting in a corresponding increased demand for water, the old system of subsurface type floods had to be abandoned, and the water required for flooding purposes obtained either from shallow wells on the property, or, if sufficient ground water was not available, from some outside source.

Although this method of handling the water problem insures an adequate supply to each intake well, it has the great disadvantage that any soluble ferrous salts present in the water are oxidized to insoluble ferric salts when the water is flowed from wells by compressed air. Formation of these insoluble gelatinous compounds plugged the sand in many wells in Bradford field and it soon became evident that they must be removed. This was accomplished by use of a high pressure, vertical type sand filter.

However, the filter alone does not solve the problem of sand plugging inasmuch as the water produced from wells by flowing with compressed air, even after leaving the filter, is essentially saturated with carbon dioxide and oxygen. It will, therefore, react with the steel tubing of the pipe line between the pumping station and the intake wells to form more insoluble iron compounds which are practically the same as those formed from the soluble salts in the raw water. For this reason the flowing of water from wells is being discontinued and turbine pumps installed for lifting the water, rather than compressors. By this method the water is not aerated and consequently does not corrode the pipe lines to any appreciable extent.

Where compressors are still used for flowing water, it is very desirable to deposit a thin film of calcium carbonate on the inside of the pipe by the introduction of small quantities of quick lime into the water after it has left the filter, thereby artificially increasing the *ph* of the water. Another way to prevent corrosion and thereby eliminate the deposition of plugging material on the face of the sand is to run the water slowly through a large container filled with crushed limestone, which will remove most of the dissolved carbon dioxide.

The water generally used for flooding purposes in the Bradford field has a very low concentration of other dissolved mineral salts even when the very objectionable iron compounds are included. The chief acid radical is bicarbonate with very minor amounts of sulfates and chlorides. Fortunately, there are no soluble carbonate salts present in the ground water, for if there were they would readily react with the large amounts of calcium and magnesium chloride, which are present in the sand, to form insoluble carbonate salts.

The possibility of reactions between soluble salts in the flood water and salts precipitated in the oil pay must not be overlooked. If appreciable quantities of soluble carbonate salts are found to be present in the flooding water, they should most certainly be removed by chemical treatment, for they will readily react with any calcium or magnesium chloride present in the sand, forming insoluble carbonates which would likely have a definite tendency to plug the sand.

[To be continued]

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AN

Evaluation Table

THIS article is written as a supplement to the article of V. G. Gabriel in the October 25, 1937, issue of The OIL WEEKLY, and presents one more valuation table to complete the conveniently arranged set which he submitted. The table presented herewith by Morris is no more susceptible to universal inexpert use than are those of Gabriel, but it does contain some additional features that have been found useful, and forms an excellent supplement to those presented by Gabriel.

THE accompanying evaluation table has been used successfully in the appraisal of a large number of producing properties, some under proration and some under conditions of natural production. It contains some limiting elements, and thus prevents values based primarily upon the volumetric method from reaching ridiculous proportions. Without these mechanical limits, arbitrary limits have to be set by the engineer, and it is often difficult, in deciding upon these limits, to procure consistency between the various elements of the appraisal.

For example, assume that the estimate of recoverable oil from a lease was 200,000 barrels, by the volumetric method, and that on this property was situated one well, the allowable production from which was 20 barrels per day, or 7300 barrels per year. If this property continued to produce at this rate from now to the end of time, without decline, the present worth of the accumulated production would never be greater than 17.1607 times the production for the present year. This develops from the fact that the cumulative present worth value of a perpetual 6 percent annuity of constant amount is 17.1607 times the annual amount, as shown in the first section of the table. Therefore, in valuing such a property, multiply the estimated future net profit per barrel by the present allowable production, and this product by 17.1607. The result is the maximum value which could possibly be ascribed to this property without assuming more rapid recovery. Now it is foolish from a valuation standpoint to assume that any property will continue to produce at a constant rate for anything like 20 or 30 years; and any valuation based upon such an assumption would be subjected to particularly close scrutiny, on that ground alone. Many properties, however, have evidenced a decline rate over many years past of approximately 5 percent per year. These are settled properties, and the determination of reasonable values for them presents a difficult problem. If a 5 percent rate be continued to the point of time at which the wells will have reached a reasonable economic limit, unconscionably large reserves will be developed. Let us examine the second section of the table, where the amount of the annuity declines at the rate of 5 percent per year. We find that even if this property produced to infinity in time, the total production which it would accumulate would not exceed 20.9995 times the past year's production, and that, at 6 percent compound discount, such an an-

Table of Factors for Annuities at 6 Percent Compound Discount at Various Rates of Decrease in the Amount of the Payment. To be applied to the Production for the Past 12 Month Period, the income being assumed to be received in one payment at the middle of each succeeding year.

	Fixed Amount—No Decline				Five Percent per Year Decline in Amount				Ten percent per Year Decline in Amount			
YEAR	Factor For Year	Accumulation No Discount	Accumulation Discounted	Composite Present Worth Factor for n Years	Amount to be Received in Each Year	Accumulation No Discount	Accumulation Discounted	Composite Present Worth Factor For n Years	Amount to be Received in Each Year	Accumulation No Discount	Accumulation Discounted	Composite Present Worth Factor For n Years
1	0.9713	1.0000	0.9713	0.9713	0.9524	0.9524	0.9250	0.9713	0.9091	0.9091	0.8830	0.9713
2	.9163	2.0000	1.8876	.9071	.9071	1.8595	1.1561	.9443	.8264	1.7355	1.6403	.9451
3	.8644	3.0000	2.7520	.9173	.8693	2.7234	2.5028	.9189	.7513	2.4868	2.2898	.9207
4	.8155	4.0000	3.5675	.8918	.8228	3.5462	3.1737	.8949	.6830	3.1698	2.8468	.8981
5	.7693	5.0000	4.3368	.8673	.7836	4.3298	3.7765	.8722	.6209	3.7907	3.3245	.8771
6	.7258	6.0000	5.0626	.8437	.7463	5.0761	4.3181	.8506	.5645	4.3552	3.7342	.8574
7	.6847	7.0000	5.7473	.8210	.7108	5.7869	4.8047	.8303	.5132	4.8684	4.0856	.8392
8	.6460	8.0000	6.3993	.7991	.6770	6.4639	5.2419	.8109	.4666	5.3350	4.3870	.8223
9	.6094	9.0000	7.0027	.7780	.6448	7.1087	5.6347	.7926	.4242	5.7592	4.6455	.8066
10	.5749	10.0000	7.5776	.7577	.6141	7.7228	5.9876	.7753	.3856	6.1448	4.8672	.7920
11	.5423	11.0000	8.1199	.7381	.6134	8.3362	6.3046	.7562	.3505	6.4953	5.0573	.7778
12	.5116	12.0000	8.6315	.7192	.5842	8.9204	6.5894	.7368	.3186	6.8193	5.2203	.7661
13	.4827	13.0000	9.1142	.7010	.5564	9.4768	6.8453	.7223	.2896	7.1035	5.3601	.7546
14	.4554	14.0000	9.5696	.6835	.5299	10.0067	7.0752	.7070	.2633	7.3668	5.4799	.7439
15	.4296	15.0000	9.9992	.6666	.5047	10.5114	7.2818	.6927	.2394	7.6062	5.5826	.7339
16	.4053	16.0000	10.4045	.6502	.4807	10.9921	7.4674	.6793	.2176	7.8238	5.6707	.7248
17	.3823	17.0000	10.7868	.6345	.4578	11.4499	7.6342	.6667	.1978	8.0216	5.7462	.7163
18	.3607	18.0000	11.1475	.6193	.4360	11.8858	7.7841	.6549	.1798	8.2014	5.8109	.7085
19	.3403	19.0000	11.4878	.6046	.4152	12.3011	7.9188	.6437	.1635	8.3649	5.8664	.7013
20	.3210	20.0000	11.8088	.5904	.3954	12.6965	8.0398	.6332	.1487	8.5136	5.9140	.6946
Perpetuity	Zero	Infinity	17.1607	Zero	Zero	20.9995	9.5666	.4556	Zero	11.0000	6.8228	.6203

WITH

Limiting Elements

nuity as would be represented by the income from this property would have a present worth only 9.5666 times greater than the value of the last year's production. Suppose this property is now producing 300 barrels per day from 10 wells of 4500-foot depth. Where will we cut off the production? Let us say that operating conditions indicate that the economic limit in this field is about 15 barrels per day. The 15th year shows that the amount to be received during that year is 0.5047 of the past year's production or an average of about 15 barrels per day, during the 15th year. The total accumulation of production through the 15th year is shown to be 10.5114 times the past year's production, and the present worth of this total to be 7.2818 times the value of the past year's production. Thus we are automatically supplied with a cut-off point and a discount factor which are in accord with the assumptions of the case and are consistent one with the other.

By ALEXANDER B. MORRIS
Petroleum Engineer

Similarly, with the third section of the table, relating to properties evidencing an annual decline rate approximating 10 percent per year. No matter how many years such properties produce, the accumulated production will never exceed 11 times the past year's production, and at 6 percent compound discount will never have a present value greater than 6.8228 times the value of the past year's production.

The final column in each section gives a composite compound discount factor to be applied to the estimated future net income from the property to reduce this gross figure to present worth. The use of this table will save many hours of work computing extensions of anual increments to income. It also demonstrates the folly of excessive refinements in defining assumptions as to the probable future rate of decline, or the number of years during which the property will continue to produce. For example, no decline in amount for 8 years, 5 percent decline in amount for 9 years, 10 percent decline in amount for 10 years, 15 percent decline in amount for 11 years, and 20 percent decline in amount for 13 years all have substantially the same composite discount factor, all falling between 0.7920 and 0.7991. For this reason the customary practice of engineers of extending present worth factors to 5 decimal places is just so much window dressing, and has no real meaning in the report. Once the total future recovery from a property has been estimated, present worth may just as well be applied by a 2-place factor. No accuracy within the accuracy of the basic assumptions of the appraisal is thus forfeited, and the engineer, by the use of the 2-place factor, avoids committing himself in too great detail in respect of points upon which he cannot possibly have any very good information.

This table also will be found very useful in making a rapid check on the value of producing royalty, where any sort of dependable production record is available. Suppose that we have a heavily prorated property which may reasonably be expected to maintain its present rate of production for, say, five years, and indefinitely thereafter. If this is offered on the basis of a 5-year pay-out, the present worth of the interest is not 5 times the past year's income, but only 4.3368 times that amount. If the property is declining at approximately 10 percent per year, the present worth of the next five years' income is only 3.3245 times the past year's income, and this property would require 11 years before the present worth of its accumulated income would equal 5 times the past year's income.

[*Continued from opposite page*]

YEAR	Fifteen Percent per Year Decline in Amount: Amount to be Received in Each Year	Accumulation: No Discount	Accumulation: Discounted	Composite Present Worth Factor For n Years	Twenty Percent per Year Decline in Amount: Amount to be Received in Each Year	Accumulation: No Discount	Accumulation: Discounted	Composite Present Worth Factor For n Years
1.....	0.8696	0.8696	0.8446	0.9713	0.8333	0.8333	0.8094	0.9713
2.....	.7562	1.6258	1.5374	.9456	.6944	1.5277	1.4458	.9462
3.....	.6576	2.2834	2.1057	.9221	.5786	2.1063	1.9461	.9239
4.....	.5718	2.8552	2.5711	.9004	.4821	2.5884	2.3394	.9038
5.....	.4972	3.3524	2.9529	.8808	.4017	2.9901	2.6486	.8858
6.....	.4324	3.7848	3.2661	.8629	.3347	3.3248	2.8917	.8697
7.....	.3760	4.1608	3.5230	.8467	.2789	3.6037	3.0828	.8554
8.....	.3270	4.4878	3.7337	.8320	.2324	3.8361	3.2330	.8428
9.....	.2844	4.7722	3.9065	.8186	.1937	4.0298	3.3511	.8316
10.....	.2473	5.0195	4.0482	.8064	.1614	4.1912	3.4440	.8217
11.....	.2151	5.2346	4.1644	.7956	.1345	4.3257	3.5170	.8130
12.....	.1871	5.4217	4.2597	.7856	.1121	4.4378	3.5744	.8055
13.....	.1627	5.5844	4.3378	.7767	.0934	4.5312	3.6195	.7988
14.....	.1415	5.7259	4.4019	.7688	.0778	4.6090	3.6550	.7930
15.....	.1230	5.8489	4.4544	.7615	.0648	4.6738	3.6829	.7880
16.....	.1070	5.9559	4.4975	.7551	.0540	4.7278	3.7048	.7836
17.....	.0930	6.0489	4.5329	.7493	.0450	4.7728	3.7220	.7798
18.....	.0808	6.1297	4.5619	.7442	.0375	4.8103	3.7355	.7766
19.....	.0702	6.1999	4.5857	.7396	.0312	4.8415	3.7461	.7737
20.....	.0610	6.2609	4.6052	.7355	.0260	4.8675	3.7544	.7713
Perpetuity	Zero	7.6669	5.4066	.7052	Zero	6.0000	4.5421	.7570

HODELL'S paper, Part I of which was published in a recent issue of The OIL WEEKLY, was presented before the Division of Production of the American Petroleum Institute in Chicago November 12. The statements and opinions expressed herein are those of the author, and should not be construed as official actions or opinions of the Institute or of The OIL WEEKLY.

Circumferential Field Welding of Casing

By L. R. HODELL, Carter Oil Company, Tulsa

PART II

Part I of "Circumferential Field Welding of Casing" went into a discussion of the welding problem itself, then the floor problem, which is that of getting necessary equipment for running welded casing and training drilling crews in the operation. It then told of a series of tests made in considering the joint problem. Part I was accompanied by five illustrations and four tables. Part II follows:

IGURES 6, 7, 8, and 9 illustrate the results had from welding 6-inch outside-diameter 17-pound grade "B" casing. A summary of the results had in testing follows:

12 joints were tested.

6 of these were plain butt-joint, welded with two beads.

3 were the bell-and-spigot joint, welded with one bead.

3 were the bell-and-spigot joint, welded with two beads.

Before pulling, all samples were tested hydrostatically to 1800 pounds per square inch. From each prepared sample enough pipe was cut off before pulling to make three coupon tests for ultimate strength, yield point, and elongation in 2-inch, and one chemical analysis. There were, then, in addition to the 12 full-joint pull tests, 36 coupon tests and 12 chemical analyses. The average values obtained for all the tests are given in Table 5.

The tests have given results which, while not wholly anticipated, are statistically consistent. It is clear that the bell-and-spigot joint welded with two beads is superior to the straight butt-joint as we are making it. These tests, and subsequent examination of the samples after failure, show clearly that the reason for the failure of the butt joints in the welds is that we are not getting complete penetration. Up to this time we had thought that we were getting complete penetration, but we are now forced to admit that we were not. This incomplete penetration produces an average efficiency of 90 percent in our butt joints. For practical purposes this is enough, and we should not be discouraged from using this type of joint if it is otherwise desirable. The average joint efficiency of threaded and coupled casing is only 74 percent.

The welding of the bell-and-spigot joint with one pass

TABLE 5

Average Values of Tests

I. No leaks occurred in any of the samples when tested to 1,800 lb. per sq. in. hydrostatically.

II. Coupon tests from stock of pipe:

	TAKEN FROM THE:		
	6 Butt-Joint Samples	3 Bell-and-Spigot One-Bead Samples	3 Bell-and-Spigot Two-Bead Samples
Yield point, lb. per sq. in.	49,737	47,247	47,197
Ultimate tensile strength, lb. per sq. in.	78,090	75 353	75,660
Elongation in 2 in., per cent	37.45	40.10	40.27

(Table Continued on next page of article)

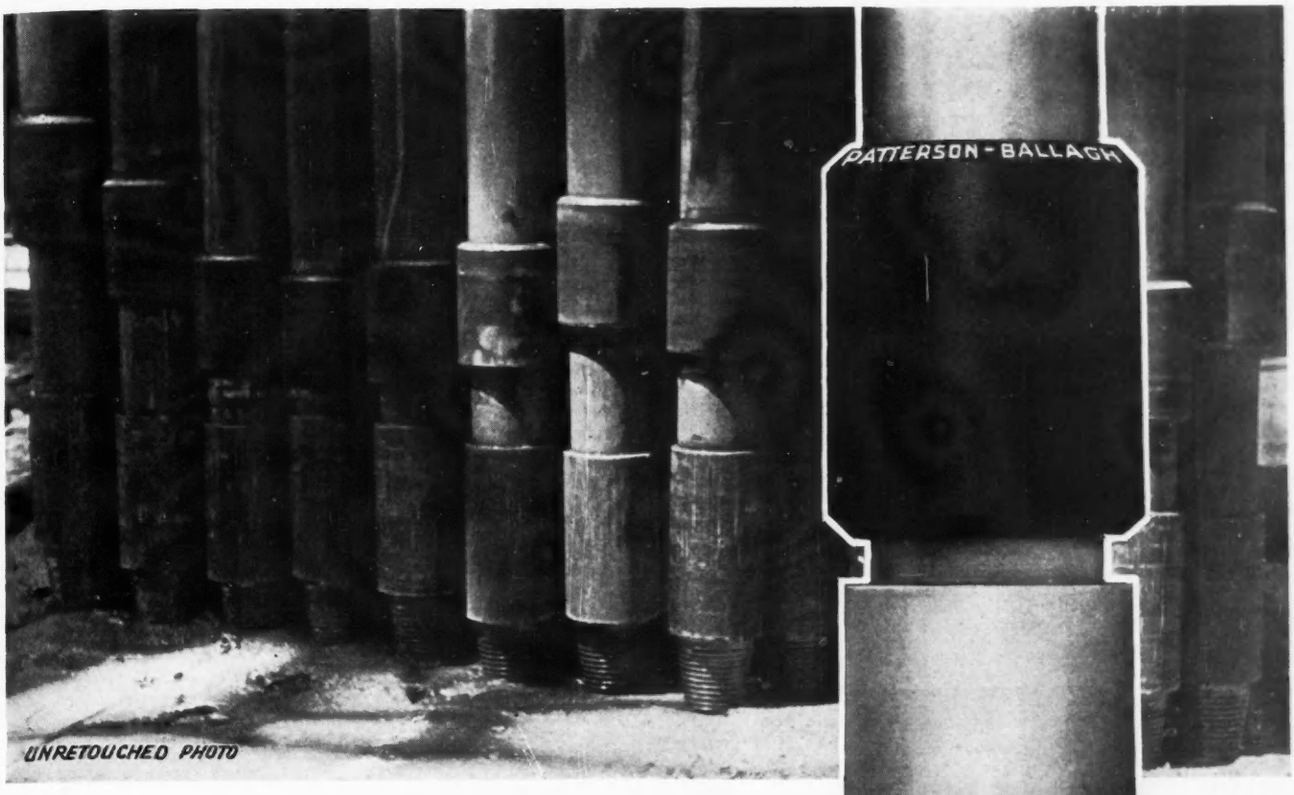

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TABLE 5 (Continued)

Average Values of Tests

III. Averaging of the 12 quantitative analyses:

	SAMPLED FROM THE:		
	6 Butt-Joint Samples (Per Cent)	3 Bell-and-Spigot One-Bead Samples (Per Cent)	3 Bell-and-Spigot Two-Bead Samples (Per Cent)
Carbon	0.268	0.263	0.257
Manganese	0.840	0.797	0.777
Silicon	0.037	0.043	0.033
Sulfur	0.029	0.0297	0.029
Phosphorus	0.019	0.0203	0.023

IV.

AVERAGE JOINT EFFICIENCIES OF THE:		
6 Butt-Joint Samples (Per Cent)	3 Bell-and-Spigot One-Bead Samples (Per Cent)	3 Bell-and-Spigot Two-Bead Samples (Per Cent)
90.42	84.3	100

V. Comments:

The low carbon content (0.26 per cent) of this grade "B" casing makes it readily-weldable, and it has been selected for that reason.

is a practice we have introduced in Kansas, and it is one that we have considered purely experimental. In view of the results obtained in these tests, we are of the opinion that it should still be regarded as experimental. While the results obtained are superior to joints made with threads and couplings, it is obviously inferior among welded joints.

In arriving at the joint efficiency in testing this lot of pipe, we divided the breaking load of full-section joint test by the minimum area of the pipe wall multiplied by the average ultimate strength of the pipe from coupon results. One factor in these tests is worthy of special attention. Figure 6 shows three tests made of bell-and spigot joint welded with two passes. We have given each of these samples a joint efficiency of 100 percent, owing to the fact that the failure was in the stock of the pipe, but this efficiency may be questioned. It will be noted that the failure in these three joints occurred in each case on the female side of the weld, and roughly at the same distance from the weld. This, of course, provokes curiosity as to whether or not it is a coincidence, or whether it is what should normally be expected. It is believed that the explanation of this is that, in belling the pipe, the pipe was first heated,

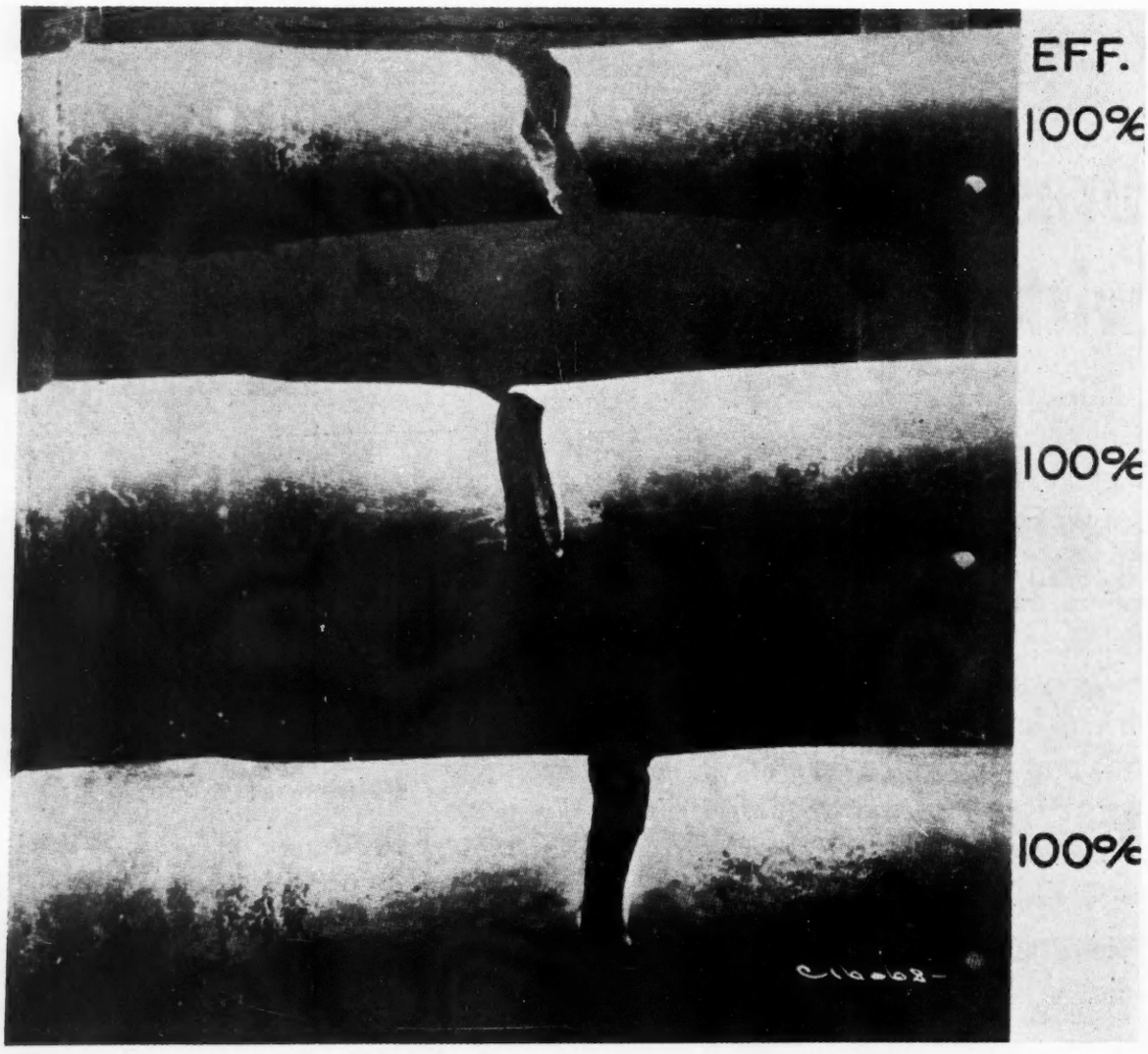
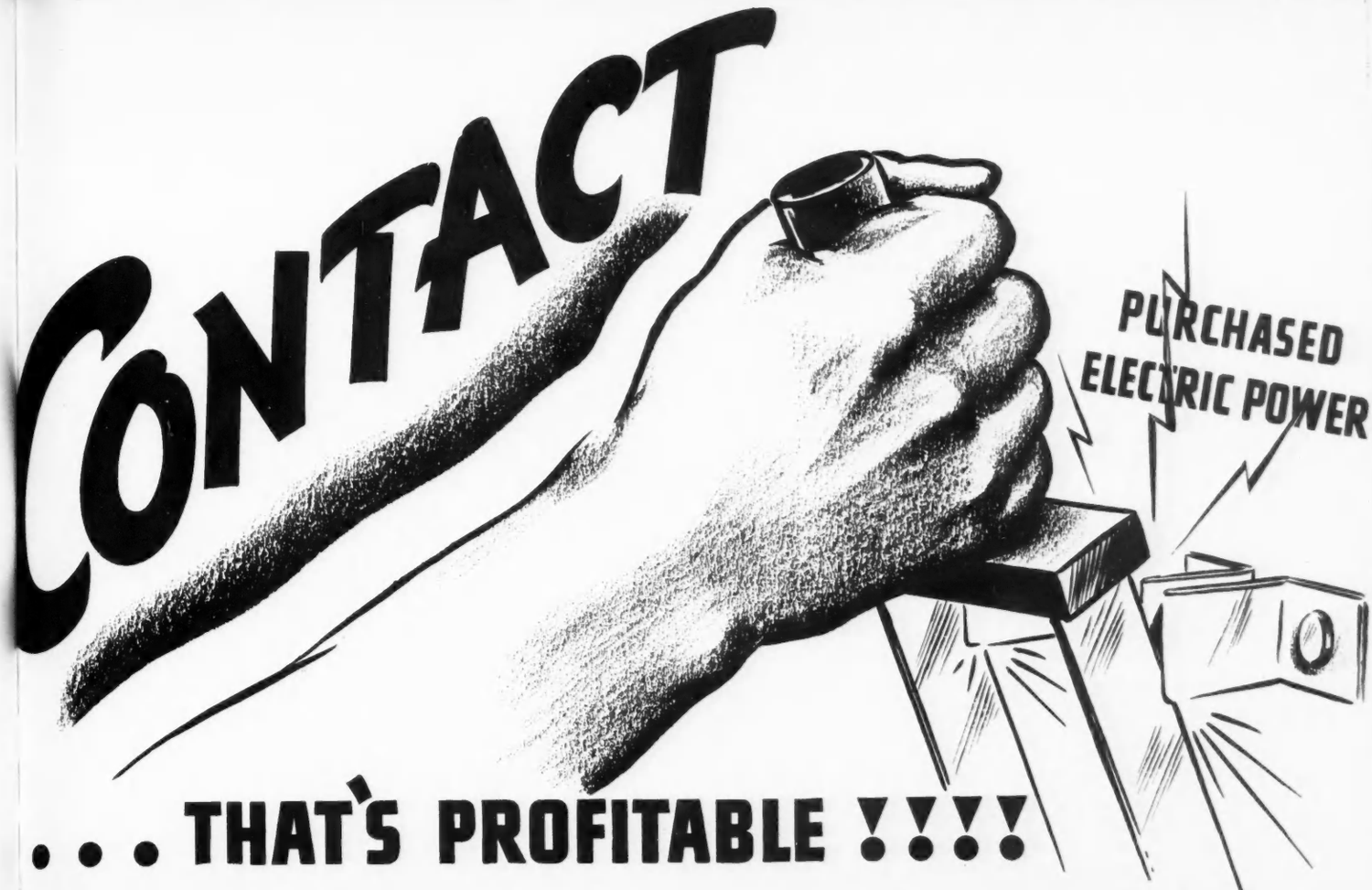


FIGURE 6

Welded Joints, 6-In. Outside-Diameter 17-Lb. Grade "B" Casing, Slip-Joint, Two Beads with Fleetwood No. 85, 3/16-In. Welding Rod.

CONTACT



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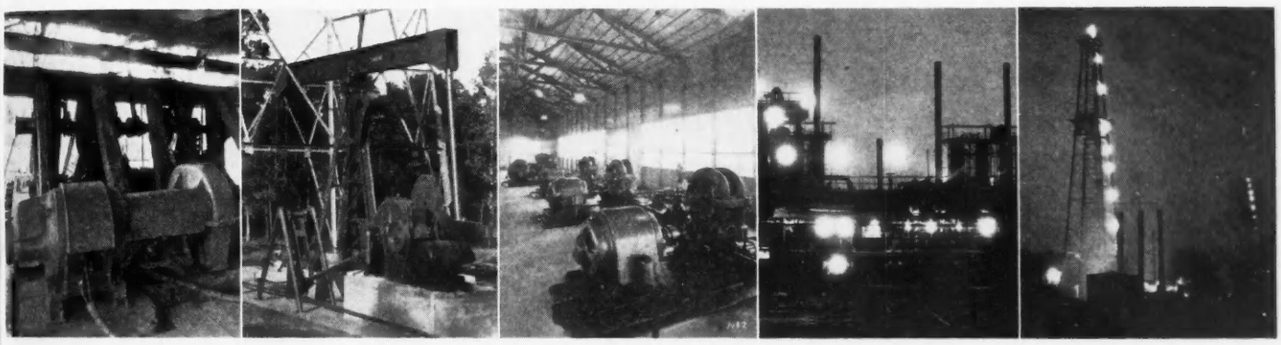

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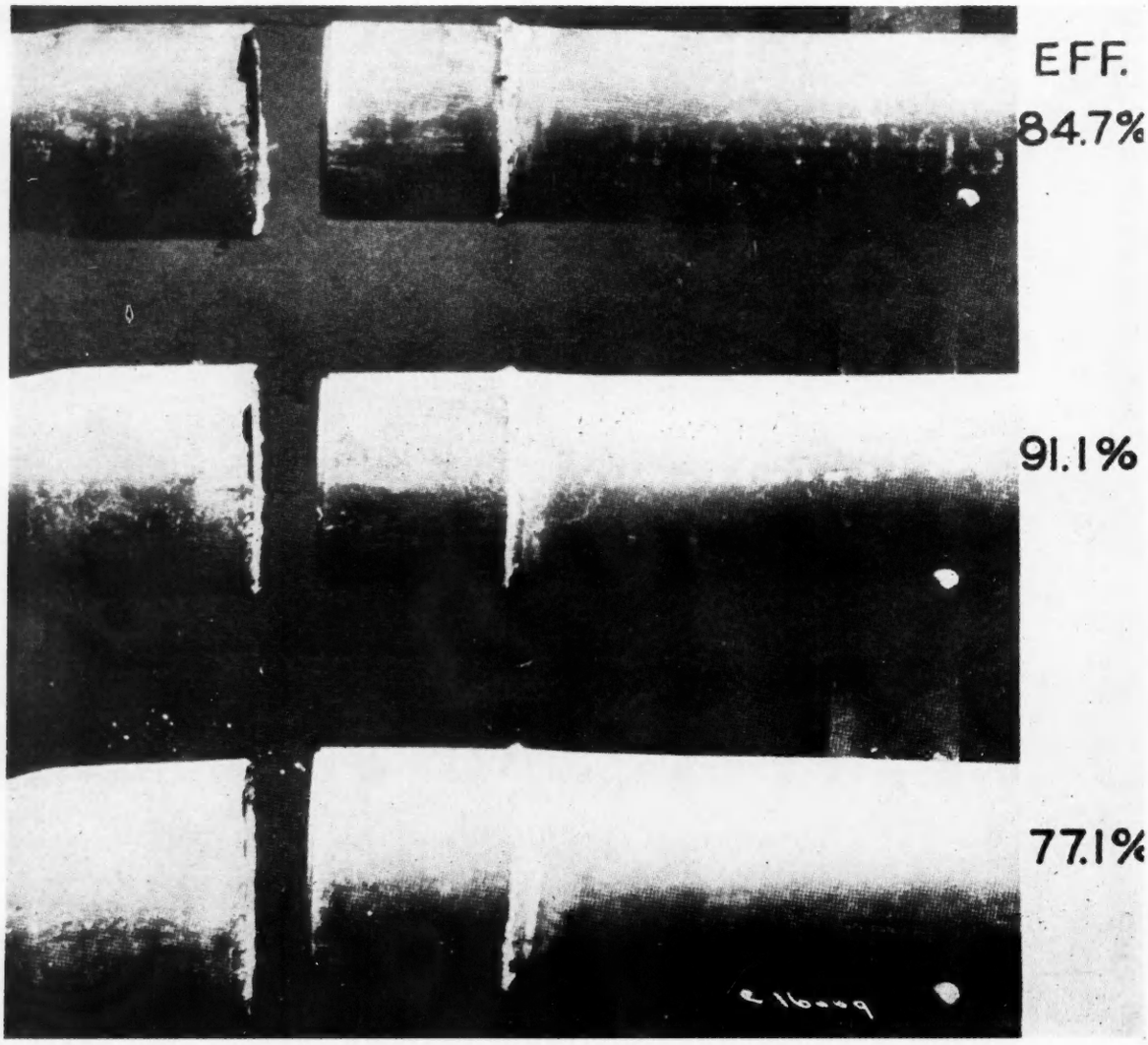


FIGURE 7

Welded Joints, 6-Inch Outside Diameter 17-Pound Grade "B" Casing, Slip-Joint, One Bead with Fleetwood No. 85 3/16-Inch Welding Rod.

resulting in a heat gradient extending from the bell along the pipe stock. It is believed that this heat lowered the ultimate tensile strength of the steel in the pipe to a very small extent. By actual calculation of the loading on the pipe at the time of failure, it appears to vary from 1 to 4 percent. From the practical point of view of making an acceptable field weld, this is not considered important.

It is of interest to note, in this connection, tests made by T. M. Jasper* on 8⅝-inch 36-pound double-bell and chill-ring joint casing. A summary of the pertinent information is given in Table 6.

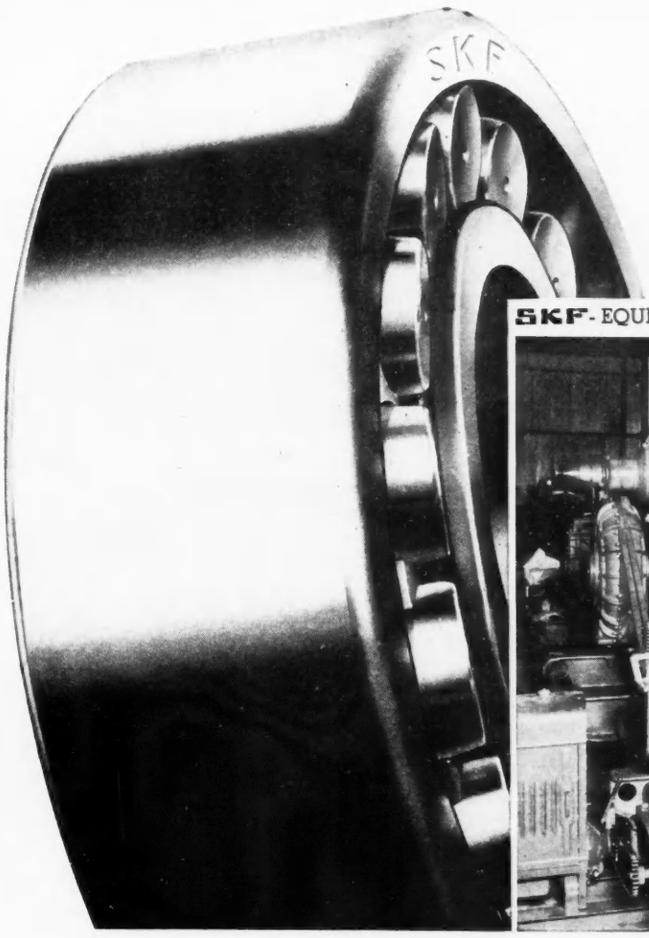
The joint efficiencies here have been calculated on the

*Personal communication.

TABLE 6

Summary of Pull Tests on Casing Pipe with Welded Field (Girth) Joint

Nominal size of pipe, in.	8⅝ × 0.400	8⅝ × 0.400	8⅝ × 0.400	8⅝ × 0.400	8⅝ × 0.400
Actual average diameter × wall, in.	8⅝ × 0.412	8⅝ × 0.410	8⅝ × 0.410	8⅝ × 0.406	8⅝ × 0.412
Kind of coupling or joint	Double-bell and chill-ring, flared ⅛ in., and arc-welded	Double-bell and chill-ring, flared ⅛ in., and arc-welded	Double-bell and chill-ring, flared ⅛ in., and arc-welded	Double-bell and chill-ring, flared ⅛ in., and arc-welded	Double-bell and chill-ring, flared ⅛ in., and arc-welded
Total load on joint, lb.	915,565	890,820	881,700	878,500	924,400
Area of pipe section, sq. in.	10.69	10.55	10.60	10.55	10.70
Stress in wall of pipe, lb. per sq. in.	85,500	84,500	83,200	83,200	86,300
Tensile strength of steel, lb. per sq. in.	94,100	94,000	92,000	92,000	92,000
Joint efficiency (on 85,000-lb. ultimate-tensile-strength electrode), per cent	100	100	97.88	97.88	100
Failure	Broke in weld	Weld O. K. broke bottom head weld	60 per cent in weld; 40 per cent in edge of weld	85 per cent in weld; 15 per cent in edge of weld	80 per cent in weld; 20 per cent in edge of weld



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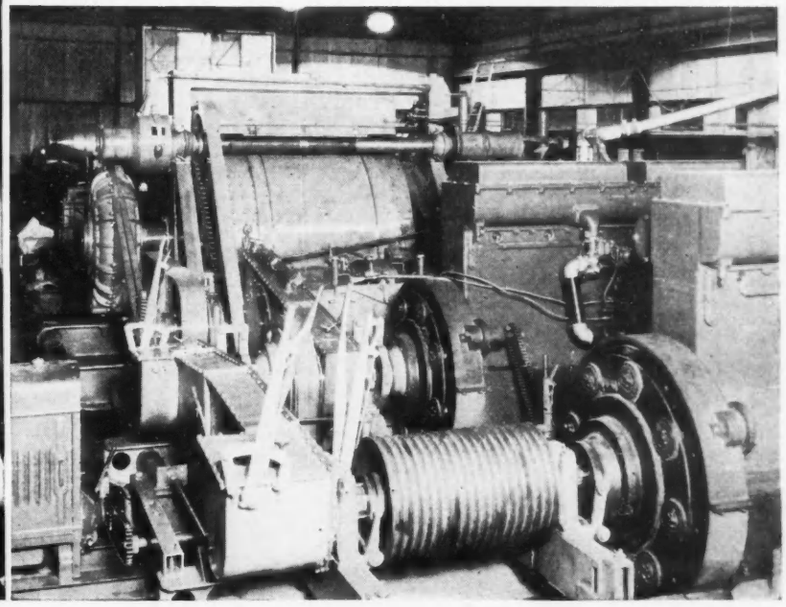

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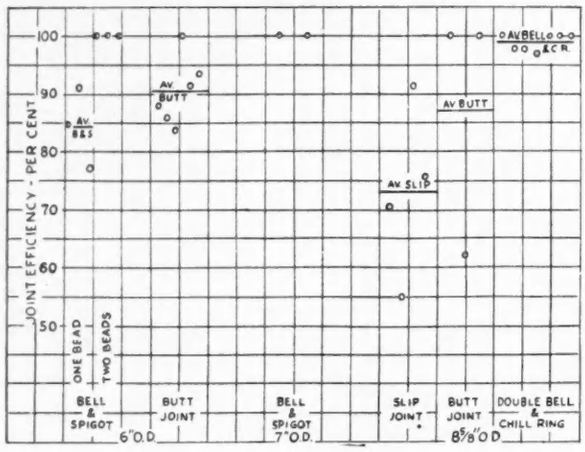

FIGURE 10
Joint Efficiencies

basis of 85,000 pounds per square inch tensile strength, that being the strength of the electrode and also the minimum guaranteed for this particular pipe.

The results obtained were consistent. The average joint efficiency of the five joints is 99 percent, based on strength of 85,000 pounds per square inch. For those who are interested in what the joint efficiency would be in case it were based on the actual ultimate strength of the pipe, it has been worked out and is 91 percent.

Figure 10 summarizes the joint efficiencies thus far discussed, and presents two principal facts:

1. The slip joint is consistently low in joint efficiency; and, 2, all of the other types of joints are well above 80 percent on the average, even when we take into this average such low joint efficiencies as were obtained with the one-pass weld. It is apparent from these joint efficiencies that, by using good judgment in choosing the type of joint and the number of passes, and other technical considerations, it is possible to feel secure in an assumption of 90 percent or greater joint efficiency. From the tests made thus far, it is apparent that, at least in the diameters and thicknesses of the pipe tested, the bell-and-spigot joint is a good joint. It is also apparent that the double-bell and chill-ring joint is a very effective joint. The plain butt joint, somewhat to our surprise, falls below the bell-and-spigot in joint efficiency. We did not anticipate this before the tests were made, because we believed that we were getting complete penetration. As a result of these tests, however, and of inspection of the samples after failure, it is apparent that, while we are getting nearly complete penetration, we are falling short of it just enough to cause the slightly lower joint efficiency in the butt welds.

Note:—Additional data presented upon delivery of this paper as follows:

Three full-joint tests on 10¾-inch butt weld; three full-joint tests on 10¾-inch double-bell and chill-ring; three full-joint tests on butt-welded 13⅜-inch; three full-joint tests on double-bell and chill-ring, 13⅜-inch; one full-joint test on 7-inch butt weld grade "C"; two

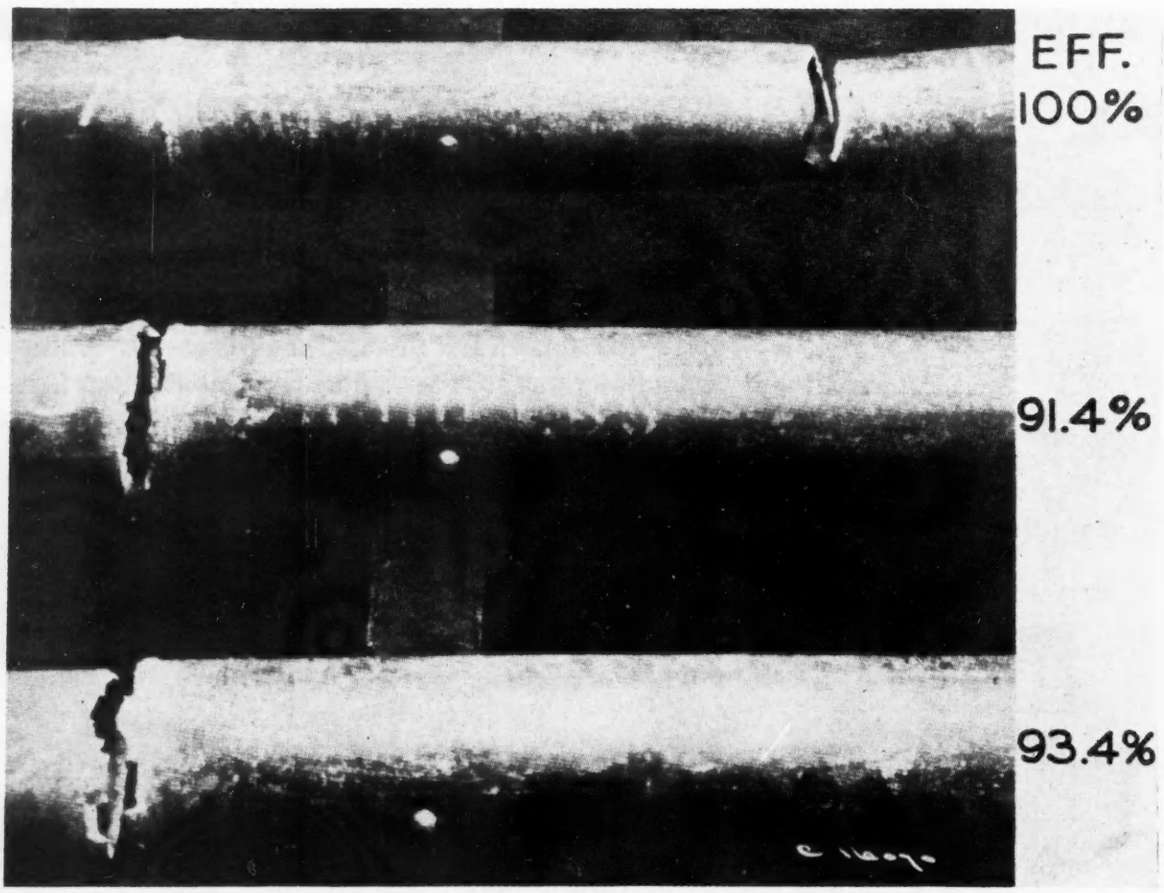

FIGURE 8
Welded Joints, 6-Inch Outside Diameter 17-Pound Grade "B" Casing Radiused Bevel Butt Joint, Two Beads with Fleetwood No. 85 3/16-Inch Welding Rod.

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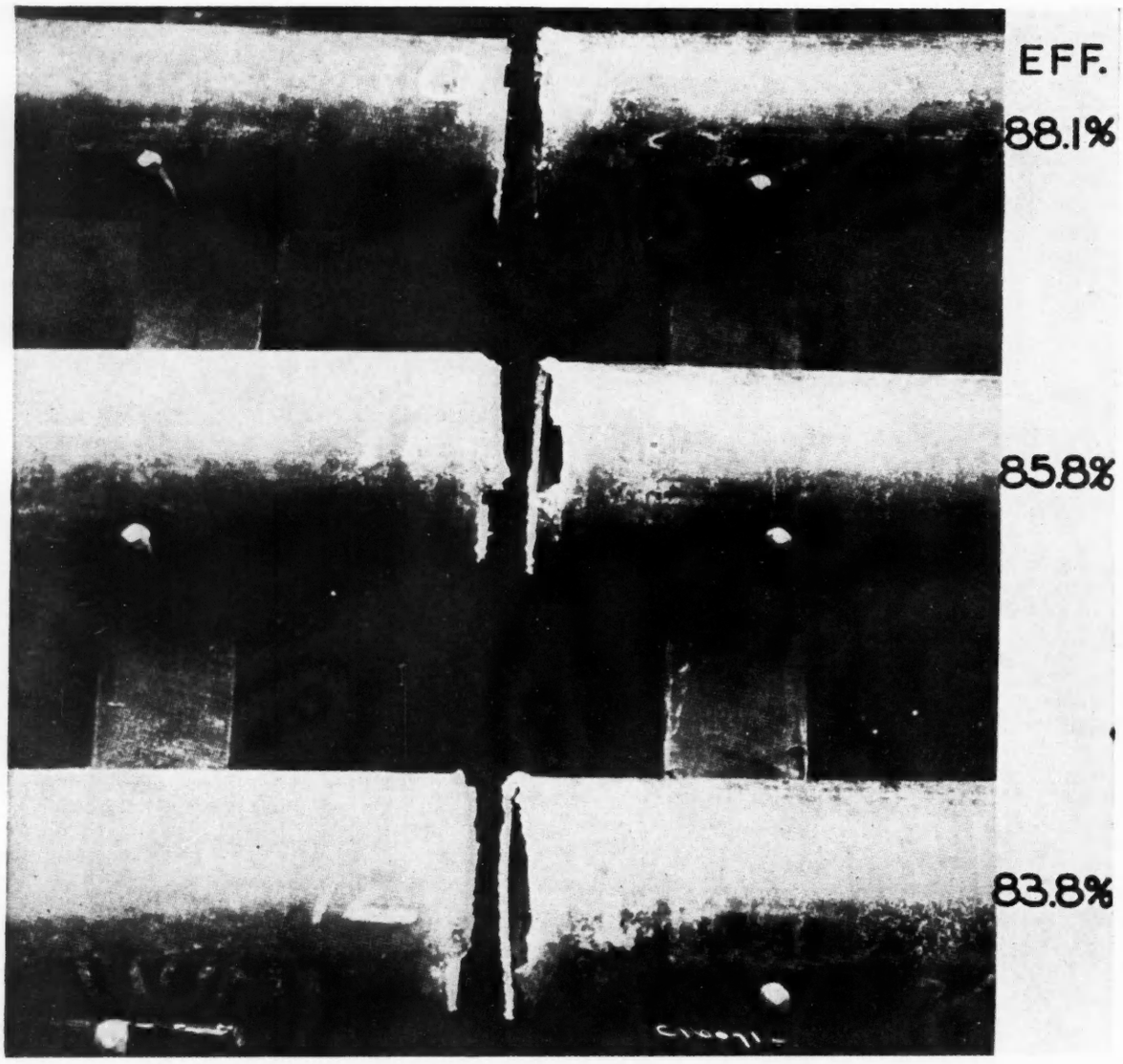

FIGURE 9
Welded Joints, 6-Inch Outside Diameter 17 Pound Grade "B" Casing Radiused Bevel Butt Joint, Two Beads with Fleetwood No. 85 3/16-Inch Welding Rod.

full-joint tests on 7-inch butt-weld heat-treated pipe. In addition, it is hoped to present data on the following also: Three full-joint tests on 9⅝-inch butt-weld heat-treated; three full-joint tests on 10¾-inch butt-weld heat-treated; three full-joint tests on 13⅜-inch grade "C" butt-weld; several tests on 4½-inch bell-and-spigot grade "A."

Rate and Cost of Running Welded Casing

To quite an extent, of course, the cost of running welded casing is a function of the speed, although cost is also affected by other factors caused by the usual conditions obtaining in production work. The principal difficulty in arriving at speeds and costs is due to the fact that in practice casing must always be run at some distance from the headquarters of the welding crew. These distances may vary from a few miles to quite a long distance. Owing to the fact that we had not welders distributed sufficiently widely, it has been necessary in some cases to send welders as far as 200 miles from headquarters. By agreement with these welders, they are paid from the time they leave headquarters until they return, and it is not at all uncommon that the amount paid for any given job may be attributed more to the time going and coming from the job than to the actual time expended on the job.

Better distribution of welding crews will, of course, lessen this item of time and cost to quite an extent. However, field conditions are such that it will always remain a factor.

To Be Continued in an Early Issue of The OIL WEEKLY

MEN IN THE INDUSTRY'S NEWS

WILLIAM H. BERG IS ELECTED PRESIDENT OF STANDARD OIL COMPANY OF CALIFORNIA

HE BEGAN HIS SERVICES WITH THE COMPANY IN 1902 AS A STENOGRAPHER

WILLIAM H. BERG, senior vice president of Standard Oil Company of California, was elected president of the company at a meeting of the board of directors held in San Francisco December 9. He succeeds Kenneth R. Kingsbury, whose death occurred November 22.

Berg began his services with the organization in 1902 at the age of 20. His first work was as a stenographer. He has been with the company since that time. He entered the production department in 1908. In 1921, Berg was appointed general manager of the foreign crude oil producing department, a position he held until February 1924, when he was elected a director. He was made a vice president in 1927.

Berg is well known throughout the industry, and is a director of the American Petroleum Institute, although always shunning the limelight.

FLOYD W. OHLIGER of Al Khobar, Saudi, Arabia, resident manager, California Arabian Standard Oil Company, a subsidiary of Standard Oil Company of California, expects to visit the United States about the first of the year.

E. H. SALRIN, vice president, headed various men of the Tide Water Associated Oil Company, Houston, last week on an extensive inspection trip through the various oil fields of coastal Louisiana. The following were included in the party: R. B. Pringle, vice president; R. T. Lions, head of land and geological department; N. W. Boston, landman; T. H. Hall, engineer; D. E. Legan, production superintendent, and George L. Nye, engineer.

A. NORCOTT, general manager, International Petroleum Company of Peru, and Mrs. Norcott, will return to Peru in January following a visit to the United States. They will be joined on the home trip by B. A. Meyers, director of International Petroleum Company.

PIERRE M. ANGOT, general manager and technical director of Societe Steana Romana de Petroles, Compania, Roumania, accompanied by R. Plesoianu, chief engineer, recently arrived on the West Coast, studying equipment, methods, etc., in California. They will return home about December 26.

T. E. WOODS, drilling superintendent, N. V. Nederlansche Kolonial Petroleum Maatschappij (Standard Oil Company of New Jersey), Sumatra, accompanied by wife and young daughter, soon will visit relatives in San Jose, California.

R. W. PARKINSON, chief mechanical engineer of Caribbean Petroleum Company, has been in Santa Monica, California, with his relatives and is to return shortly to Venezuela.

L. McKILLOP, field superintendent of Oil Search, Ltd., Sydney, New South Wales, arrived in the United States early in November and is now in the Mid-Continent regarding field operations and equipment and will visit California before returning to Australia.

S. B. SCHNITTER, representative in Trinidad, Venezuela, and Colombia for the several American oil field equipment manufacturers will leave early in January for his headquarters in Port of Spain. He was accompanied by his wife and daughter during his visit to the United States.

PAT and **MAT CODY,** land owners of Nueces County, tendered a barbecue to employes of Baltic Drilling Company and others last week in celebration of the completion of a second good well on their land south of Clarkwood in the Saxet field.

W. L. CHILDS, vice president of Reed Roller Bit Company, has been elected president of the Houston Chamber of Commerce. He succeeds James Anderson, vice president of Humble Oil & Refining Company, who has been president of the chamber for two years.

ALEX W. McCOY, geologist and petroleum engineer, of Ponca City, has been selected by Governor E. W. Marland of Oklahoma to assemble data on the nation's oil reserves for the governor's proposed price-stabilization conference. The report is expected to be completed around January 1 for use at the conference around January 15. McCoy is a former dean of geology at the University of Oklahoma and was on the staff of the old Marland Oil Company. In recent years he has maintained an office as consulting geologist.

C. W. SANDERS has returned to the geological staff of the Shell Petroleum Corporation in Houston after nearly two years' absence. The first year was spent in Europe and the past 10 months in California with Shell Oil Company.

P. S. HAURY, consulting geologist and petroleum engineer, has established an office at 707 Santa Fe building, Dallas. He was petroleum engineer for Simms Oil Company, and when the latter was absorbed by Tide Water Associated Oil Company he spent several years with a concern in Chosen (Korea).

NATHAN L. JONES, former Kansas utility engineer, is head of the Central States Oil Company, organized last week as a Colorado corporation to explore and develop production throughout Kansas. The company, of which M. O. Quinn is secretary, has let contracts for two wildcat tests to be drilled immediately in Trego and Gove counties, projected for 4800 and 5000 feet, respectively.

FRANK MacKAY, Superior Oil Company vice president, and Mrs. MacKay are visiting in Monterrey, Mexico.

LEIGH H. CHRISTIAN, James T. Norris and Cecil T. Goodwill, all of Owosso, Michigan, are organizers of the Lenoran Petroleum Company, which was granted a Michigan corporation charter last week.

MARTIN W. BADEN and Paul Trees, oil operators of Winfield, Kansas, were injured recently when a front tire on their automobile blew out while they were driving from Wichita to Baden's test near Dodge City, Kansas. Baden suffered two cervical vertebrae fractures and multiple concussions, but his condition is not considered critical. Trees suffered numerous bruises.

LEE ADAMS, Oklahoma City, chairman of the executive committee of the National Oil Scouts Association, addressed the Kansas Oil Scouts Association last week at Wichita. Lee H. Cornell, scout for the Stanolind Oil & Gas Company and president of the scouts' state organization, presided.

GENTRY KIDD, geologist for Stanolind Oil and Gas Company's San Antonio office, and Stuart Mossom, Magnolia Petroleum Company geologist in San Antonio, were Coastal visitors recently.

EDWARD ROSENBURG of New York has entered South Texas with a shallow drilling program, making L. W. Adam of 203 Turner Street his field representative.

O. A. LAIRD, general manager, South Islands Mining Company, Panay, Philippine Islands, is now in California looking over drilling equipment in contemplation of drilling in the Philippines.

CLAUD E. KELLY, drilling superintendent of Drilling & Exploration Company, which is drilling a well in Peru for Cia Petrolifera Gauso Azul, Masisea, Peru, left late in November to start operations.

"TIGRE" E. SANDERS of Caripito, assistant drilling superintendent, Standard Oil Company of Venezuela, is in Southern California on vacation and will return to Venezuela in January. R. D. Evans of the drilling staff left for the field several weeks ago. Douglas Fyfe, general manager of Gauso Azul, sailed with Evans.

"SHORTY" CHANDLER, partner in the drilling firm of Chandler & Newell, was badly hurt recently by a blow from a lever while at work on the Brown Oil Corporation's No. 3 well in Turner Valley, Alberta, Canda. He is recovering in a Calgary, Alberta, hospital.

JOSEPH S. IRWIN, consulting geologist, told members of the Alberta Society of Petroleum Geologists meeting in Calgary last week that proration in Turner

Valley is "no cause for dismay." He said that "Alberta finds herself in the same position experienced in all important United States fields where production has increased faster than existing transportation facilities and local markets could handle it."

A. J. HARDENDORF, of Houston, Texas, at one time a drilling contractor in the Salt Creek field of Wyoming and recently engaged in drilling and pipe line construction projects in Texas and Kansas, has acquired Woodson Oil Company, formerly owned jointly by Continental Supply Company and Harry Isenberg, Los Angeles. The property consists of eight wells, of which six are producing, and 800 acres of land in the Hudson pool, near Lander, Wyoming.

AARON F. WOOD, of Port Lavaca, Texas, and Dale W. Moore, of Tulsa, Oklahoma, organized as the Wood-Moore Producing Company, a Delaware corporation, have announced intentions to operate in Texas.

DILWORTH S. HAGER, consulting geologist and producer, was elected president of the Dallas Petroleum Geologists, succeeding Charles B. Carpenter, associate petroleum engineer of the United States Bureau of Mines. R. E. Rettger, Sun Oil Company, and W. W. Clawson, Magnolia Petroleum Company, were chosen vice president and secretary-treasurer, respectively.

H. E. MINOR, head of the Geological department of Gulf Oil Corporation at Houston, Paul B. Leavenworth and Dr. F .M. Siebert, also with Gulf Oil Corporation at Houston, visited Corpus Christi during the week.

MINOR S. JAMIESON, JR. has been engaged by the Independent Petroleum Association of America, as research and statistical expert, in order to present to members of congress and other public officials an intelligent analysis of the tax problems of the association.

M. G. HANSBRO, with Pearland Oil Company, Houston, has returned to his desk after a business trip to Dallas, Texas.

THOMAS O. PAYNE, president of Cottonbelt Oil Company, Houston, is at present visiting in Huntington, West Virginia.

C. E. THOMAS, independent operator of Corpus Christi, Texas, was visiting in Houston last week.

EDWIN BRADLEY, operator of Wichita, Kansas, is opening an office at 436 Milam Building, San Antonio. His land man, Fred Dumerese of Houston, was formerly stationed at Wichita with Sinclair Prairie Oil and Gas Company.

J. B. OSBORNE is representing Fleetborn Oil Company of Tulsa, Oklahoma, in San Antonio.

PAUL G. BENEDUM and **HARRY McCORMICK,** oil operators of Houston, recently returned from a successful hunting trip in West Texas.

JOSEPH H. SPURLOCK, with Oklahoma Pipe Line Company, Oklahoma City, has been transferred from Crescent, Oklahoma, to Wewoka, Oklahoma.

HARRY LANGSPECHT, independent oil operator of Oklahoma City and former chief scout for Shell Petroleum Corporation, was recently married to Miss Caroline Hopping of Tulsa.

A. FRED HOLMES, Tulsa, of the Oklahoma Natural Gas Company, has been re-elected to the board of directors of the Oklahoma State Junior Chamber of Commerce.

THOMAS WEIR, Toronto, has been named secretary, treasurer and comptroller of Union Gas Company of Canada, succeeding A. Ross MacKenzie, resigned.

S. S. DAWSON, chief engineer, Oil Well Engineering Company, Ltd., Cheadle Heath, Stockport, England, has returned home after an extensive trip through the United States.

CHARLES L. CLARK of Socony-Vacuum Oil Company, who recently returned to California from Egypt will soon leave to take charge of operations in Colombia, S.A.

JAMES CAIRD, engineer, Sarawak Oilfields, Ltd., Miri, Sarawak, who has spent several months in the United States checking over field operations and equipment, will sail from San Francisco early in January, with Mrs. Caird, for Borneo.

DIED:

LEE D. HARMES, 45, independent oil operator, Houston, died suddenly of heart attack in the Esperson Building, Houston, December 8. Harmes, a native of Cuero, Texas, started his career with the Southwestern Bell Telephone Company in that city. He later accepted a position with the Southern Pacific Railroad Company and established his home in Houston. In 1930, Harmes became connected with the oil industry, in which he was active until his recent death. Survivors are his wife and son.

GUY C. RICE, of Rice, Welch and Tuohey, producing firm active in Western New York and Northern Pennsylvania, died December 5 at his home in Olean, New York, following a heart attack. Surviving are his widow, two brothers and two sisters.

THOMAS EADY, 61, developer of several oil bearing properties in Southwestern Ontario, Canada, died December 2 at his home in Petrolia, Ontario, after an illness of two years. He operated with his father, the late Thomas Eady, in the development of Ontario oil properties. Surviving are his wife and three sons.

FRED R. WELLER, 73, president of the Standard Oil Company of Louisiana from its founding in 1909 until 1920, when he was succeeded by his brother, the late D. R. Weller, died December 2 at Daytona Beach, Florida. For many years he was a member of the board of directors of Standard Oil Company of New Jersey.

WILLIAM O'MARA, 36, oil field worker, was killed December 1 when struck by a beam that fell from the top of a derrick in the Badger basin field, 25 miles northwest of Powell, Wyoming. He is survived by his widow.

BERNARD KNIGHT, 28, accountant for Cia. Mexicana de Petroleo "El Aguila" S. A. at Tampico, Mexico, died unexpectedly of blood poisoning, resulting from an infection, on November 22. He was the son of J. Dare Knight, in charge of the labor department of the same refinery.

J. L. DAVIDSON, 58, West Texas district warehouseman for the Gulf Oil Corporation, died December 1 at his Odessa residence. He was stricken with a heart attack, and pneumonia followed. Survivors include his widow and a son, Dr. Harry Davidson, Seagraves, Texas.

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General Outlook Promising

Control of output firms prices of crude and products and keeps industry in position to benefit from improved outlook

THE oil industry's markets have continued steady, and the immediate outlook is generally promising, although the gasoline situation constitutes ground for further anxiety.

Prices last week were largely the same as in the previous week throughout the industry, from well to service station.

Prices Are Holding

The crude oil market has not lost any additional ground following the recent reduction of 15 to 18 cents a barrel in the Pennsylvania district. And the prices for refined products also have continued mostly unchanged for the third consecutive week, whereas the whole gasoline market had been steadily declining previously for about two months.

The stability that has developed in the oil industry's markets undoubtedly has been due in considerable part to the prevailing strict control of crude oil production. Furthermore, the oil markets probably have been affected favorably lately by the development of a somewhat more cheerful spirit in business in general.

Statistics Favorable

In consequence of the prevailing close balancing of crude oil production with market demand, the statistics of the petroleum industry have continued generally satisfactory.

Crude production has come down to quite moderate levels, under the November and December state allowables. In the week ended December 4, crude oil production averaged 3,387,000 barrels daily. That was 12.8 percent more than the output in the corresponding week of last year. But an increase of about that amount over a year ago is largely justified, since petroleum demand has been running this year about 10 percent greater than last year.

Refinery operations also have been brought down to very moderate levels. In the week ended December 4, crude runs to stills averaged 3,230,000 barrels daily, which was only 8 percent more than the runs in the similar week of last year.

Fuel Stocks Moderate

The industry has continued to expand fuel oil stocks, in anticipation of heavy consumer demand. As of December 4, gas and fuel oil stocks aggregated 121,329,000 barrels, or about 10 percent more than on the corresponding date last year. This 10 percent expansion of fuel oil stocks, however, is more than justified, since the demand for fuel oil has been running about 15 percent higher than last year.

Continued heavy demand for fuel oil is foreshadowed by the recent figures on sales of oil burners. The Census Bureau has reported that shipments of distillate burners in October, this year, totaled 199,580, compared with 96,909 in September, and with 95,548 in October of last year.

The current strength of the fuel oil market was demonstrated December 2 through the action of Standard Oil Company of Indiana. The company advanced sub-normal kerosene, tractor fuel, and furnace oil prices ½-cent a gallon throughout its wide marketing territory, including Indiana, Illinois, Minnesota, Iowa, North Dakota, South Dakota, Michigan, Missouri, and Kansas. However, no change was made on these products in the Chicago or Detroit metropolitan areas.

Gasoline Market Unsteady

Although gasoline prices have been holding largely unchanged in the past few weeks, various unfavorable factors still characterize the gasoline market, and it probably is destined to remain unsettled throughout the next several months of winter weather and reduced motoring.

Cold weather lately has been tending to hold down the demand for gasoline, and reduced general business and employment also may have begun to act as a drag on gasoline consumption.

At any rate, the oil industry has not been having any success in achieving a more satisfactory gasoline inventory situation, the storage being now, in fact, farther out of line with demand than heretofore.

In the week ended December 4 the gasoline stocks were increased by the large addition of over 1,500,000 barrels, rising to 70,193,000 barrels, the highest level on record for this time of year. At that level, the stocks were 21.7 percent larger than on the corresponding date last year.

That large gain over a year ago is unwarranted, as demand for gasoline is running only moderately higher than last year. In September, this year, the domestic demand for gasoline was only 6.6 percent larger than in September, last year; although export business showed a large increase and brought the total gasoline demand for September up to a level about 10 percent higher than in that month last year.

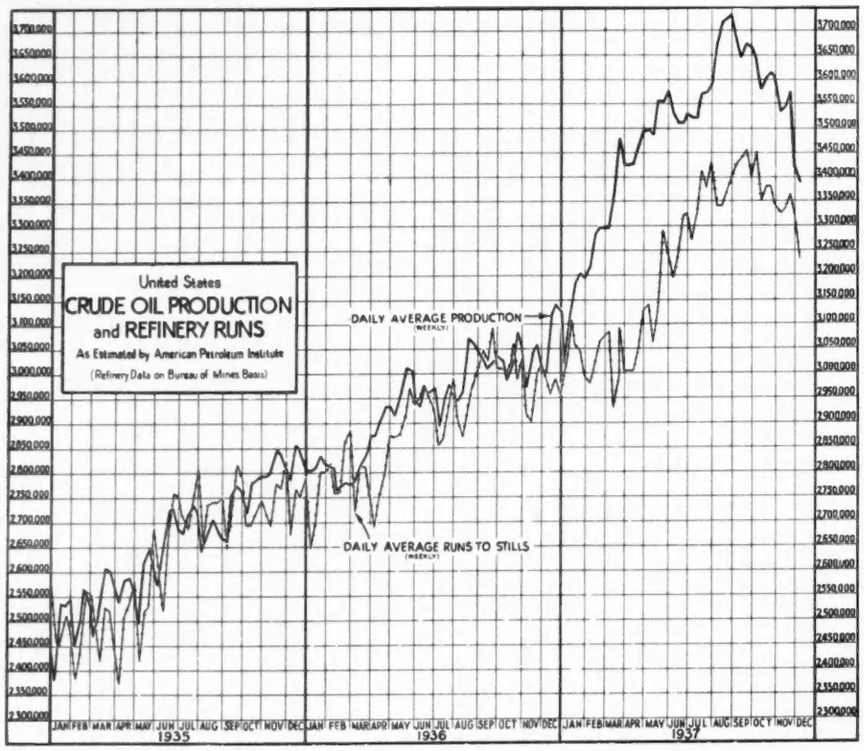
U. S. motor gasoline ranged in the Oklahoma market last week about as follows: 62 octane and below, 4⅛ to 4⅜ cents a gallon; 63 to 66 octane, 4½

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports.

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	*83,538,000	96,591,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 29	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 25	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
October 2	3,647,450	3,400,000	309,036,000	65,266,000	117,076,000
October 30	3,602,950	3,345,000	307,140,000	66,836,000	121,070,000
November 27	3,425,800	3,325,000	304,156,000	68,544,000	121,616,000
December 4, 1937	3,387,000	3,230,000	.....	70,193,000	121,329,000
December 5, 1936	3,000,200	2,990,000	†288,630,000	57,696,000	110,287,000
Change in past year	+12.8%	+8.0%	+5.4%	+21.7%	+10.0%

* All time peak. † Stocks November 28, 1936.



to 4¾ cents; 67 to 69 octane, 4⅞ to 5⅛ cents; and 70 to 72 octane, 5⅛ to 5½ cents.

Corresponding prices in the Chicago market were as follows: 3⅞ to 4¼ cents, 4¼ to 4¾ cents, 4½ to 5 cents, and 4¾ to 5¼ cents.

In East Texas the most common gasoline, 60-62, 400 end-point, was priced from 4¼ to 4⅜ cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4 to 4¼ cents a gallon for the 41-43 water white grade, and from 4⅛ to 4⅜ cents for the 42-44 water white grade. Corresponding prices in the Chicago market were: 4 to 4¼ cents and 4⅛ to 4⅜ cents.

Fuel oil prices were mostly unchanged. In the Chicago market range oil was priced from 4 to 4⅛ cents a gallon. The No. 1 white oil was priced from 4 to 4⅛ cents, and the No. 1 straw from 3⅞ to 4 cents. No. 2 straw was 3¾ to 3⅞ cents and No. 2 dark from 3½ to 3⅝ cents. No. 3 oil was 3⅜ to 3½ cents. No. 4 was $1.05 to $1.10 a barrel to domestic consumers and 95 cents to $1.10 to industrial buyers. No. 5 oils were 80 to 85 cents for domestic and 77½ to 85 cents for industrial sales. The No. 6 oil was quoted to the usual industrial customers at 55 to 65 cents a barrel.

Summary of Wells Completed in the United States Week Ending December 11, 1937

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total, 1937	Total this Date, 1936
Alabama	.....	.....	.....	.....	.....	2	2
Arkansas	10	8	.....	2	8,315	138	90
California	23	19	.....	4	9,520	1,397	1,063
Colorado	.....	.....	.....	.....	.....	18	18
Florida	.....	.....	.....	.....	.....	1	2
Illinois	11	4	.....	7	3,380	361	4
Indiana	24	7	10	7	90	146	165
Kansas	55	33	1	21	34,007	2,579	1,622
Kentucky	17	6	5	6	80	541	267
Louisiana	8	6	1	1	2,902	951	970
Michigan	16	10	.....	6	1,392	906	742
Mississippi	.....	.....	.....	.....	.....	15	8
Montana	.....	.....	.....	.....	.....	193	189
Nebraska	.....	.....	.....	.....	.....	.....	1
New Mexico	11	9	1	1	3,814	655	547
New York	.....	.....	.....	.....	.....	25	.....
Ohio	32	9	16	7	226	1,425	1,859
Oklahoma	49	25	8	16	6,431	2,829	2,738
Pennsylvania	8	1	5	2	20	203	.....
Texas	334	237	9	88	394,095	14,491	12,073
Utah	.....	.....	.....	.....	.....	1	.....
West Virginia	24	4	15	5	64	935	598
Wyoming	.....	.....	.....	.....	.....	102	93
Total this week	622	378	71	173	464,336	27,914	23,051
Total last week	494	340	59	95	300.424	.....	.....
Total this year	27,914	19,481	2,415	6,118	23,265,336	.....	.....

CRUDE OIL PRICES

Complete tables of prices paid for crude oil at the well in principal fields is shown on page 60 in the issue of December 6. This schedule will appear only in the first issue of each month.

Bureau October report shows production drop

Despite a drop of 88,200 barrels in the daily average, from 3,666,000 barbarrels for the month, according to total production of crude petroleum in October topped the September output by 931,000 barrels, reaching 110,911,000 barrels for the month, according to figures compiled by the Bureau of Mines.

The October total was more than 15,000,000 barrels above the 95,795,000 barrels reported for the corresponding month last year. Daily average output was 488,000 barrels above that of October, 1936.

A downward trend in production was general throughout the country in October, the bureau reported, California being the only important producer showing an increase, while in the minor states the only gains were in Arkansas, where production was still under the influence of the Rodessa boom; Illinois, still enjoying a boom in the Clay County area, and Michigan.

The heaviest decline in daily average output during the month was in Texas, where East Texas was the only major district to hold its own. Oklahoma's average declined below the 600,000 barrel mark for the first time since November, 1936; Louisiana, which had been establishing new peaks in almost every month, experienced a decided decline in October, due primarily to the withdrawal of pipeline outlets in the Lisbon field.

Runs to stills, the report showed, moved in unison with production. The daily average declining from 3,450,000 barrels in September to 3,388,000 barrels in October. The trend in crude stocks continued much the same, the reduction for the month being 1,270,000 barrels, compared with 1,181,000 barrels withdrawn in September.

Gasoline yields, which were abnormally low during the summer months, rebounded to 44.6 percent, or 1.1 percent above September, it was reported.

The indicated domestic demand for

Comparison of Permits Granted for New Wells

STATE	Week Ending Dec. 11	Total this Mo.	Total this Year	Total this Date Last Year	1936 Year Total
Arkansas	....	4	235	95	103
California	28	56	1,528	1,006	1,054
Louisiana	26	43	1,205	1,048	1,107
Kansas	41	69	2,603	1,744	1,873
Michigan	25	29	932	717	762
Oklahoma	42	76	2,636	2,741	2,594
Texas	172	514	16,517	14,284	15,582
Total	334	791	25,656	21,635	23,075

Again Going Up

United States daily average at 3,422,000 barrels still is below figure set by the Bureau of Mines.

UNITED STATES crude oil production rose again during the week ended December 11, averaging 3,422,400 barrels daily, which, however, was still 68,900 barrels a day less than the Bureau of Mines recommendation for the month of December.

Higher production resulted from gains in California, Oklahoma, Kansas and New Mexico, which greatly outweighed small declines in Texas and Louisiana.

California output was 13,000 barrels a day higher than in the previous week, averaging 713,000 barrels daily, which was 33,600 barrels a day more than the Bureau of Mines estimate and 38,400 barrels more than the recommendation of the Central Committee of California Oil Producers.

Oklahoma production was up 4075 barrels above the previous week's level, in averaging 560,175 barrels a day, which was 28,625 barrels daily under the estimated demand, but 10,175 barrels above the state allowable.

Kansas last week average 178,875 barrels a day, 10,100 more than in the previous week, 7125 barrels daily less than the Bureau of Mines recommendation, and 2275 barrels more than the allowable prescribed by the state.

New Mexico showed a gain of 3600 barrels, averaging 107,600 barrels a day, which was 3500 barrels daily above the indicated demand, but was in line with the state allowable.

Texas showed a decline of 2000 barrels daily, averaging 1,313,200 barrels a day, or 86,600 barrels daily less than the Bureau of Mines recommendation, and 40,943 less than the state allowable.

Louisiana output decreased 650 barrels to 242,425 barrels a day, which was 1575 under the indicated demand and 11,550 barrels a day below the state allowable.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Dec.)	State Allowable in December	BARRELS DAILY FOR WEEK ENDING December 11	December 4
TEXAS—				
Texas Panhandle	.....	.....	71,800	72,400
North Texas	.....	.....	72,300	72,500
West Central Texas	.....	.....	33,500	33,600
West Texas	.....	.....	191,200	188,500
East Central Texas	.....	.....	92,700	99,800
East Texas Field	.....	.....	417,800	415,700
South Texas	.....	.....	241,400	240,400
Texas Gulf Coast	.....	.....	192,500	192,300
Total Texas	1,399,800	†1,354,143	1,313,200	1,315,200
CALIFORNIA—				
Long Beach	.....	.....	58,000	58,000
Santa Fe Springs	.....	.....	41,000	41,500
Huntington Beach	.....	.....	37,000	35,000
Dominguez	.....	.....	30,000	30,000
Inglewood	.....	.....	16,000	15,500
Ventura Avenue	.....	.....	35,500	34,500
Seal Beach	.....	.....	8,500	9,000
Midway-Sunset	.....	.....	76,000	78,500
Elwood	.....	.....	7,800	8,000
Kettleman Hills	.....	.....	82,500	81,500
Mountain View	.....	.....	15,500	15,000
Playa del Rey	.....	.....	8,000	8,000
Wilmington	.....	.....	63,800	63,000
Others	.....	.....	233,400	222,500
Total California	679,400	*674,600	713,000	700,000
OKLAHOMA—				
Oklahoma City	.....	.....	130,625	114,375
Seminole Area	.....	.....	105,075	108,475
Crescent	.....	.....	8,100	10,700
Lucien	.....	.....	13,000	13,100
Fitts	.....	.....	78,350	82,225
Edmond	.....	.....	11,800	12,500
Moore	.....	.....	9,700	9,500
Others	.....	.....	203,525	205,225
Total Oklahoma	588,800	550,000	560,175	556,100
LOUISIANA—				
North Louisiana	.....	.....	70,725	74,875
South Louisiana	.....	.....	171,700	168,200
Total Louisiana	244,000	253,975	242,425	243,075
KANSAS—				
Ritz-Canton	.....	.....	5,025	4,100
Chase	.....	.....	6,850	6,375
Hollow-Nikkel	.....	.....	2,550	2,600
Sedgwick	.....	.....	3,750	3,850
Burrton-Haven	.....	.....	10,125	10,025
Lorraine	.....	.....	2,750	2,750
Russell County	.....	.....	28,500	28,750
Silica-Isern	.....	.....	15,550	11,900
Others	.....	.....	103,775	98,425
Total Kansas	186,000	176,700	178,875	168,775
NEW MEXICO	104,100	107,600	107,600	104,000
MICHIGAN	51,800	.....	53,800	54,800
ARKANSAS	33,900	.....	46,225	44,100
MOUNTAIN STATES—				
Wyoming	57,100	.....	50,300	55,200
Montana	15,800	.....	15,200	15,000
Colorado	4,400	.....	4,300	4,200
Total Rocky Mountain States	77,300	.....	69,800	74,400
EASTERN STATES—				
Pennsylvania Grade	.....	.....	80,600	77,300
Southern Illinois (New Pools)	.....	.....	21,700	21,800
Illinois-Indiana (Old Pools)	.....	.....	15,000	15,000
Others, Eastern	.....	.....	20,000	20,000
Total Eastern States	126,200	.....	137,300	134,100
Total United States	3,491,300	.....	3,422,400	3,394,550

† Allowable as of November 16; increased by December 1 through completion of new wells.
* Recommendation of Central Committee of California Oil Producers.

motor fuel for the month was 45,361,000 barrels, or 2.5 percent above October, 1936.

New supply. Domestic production: Crude, 110,911,000; Daily average, 3,578,000; Natural gasoline, 4,418,000; Benzol, 229,000; Total production, 115,558,000; Daily average, 3,728,000. Imports; crude in bond, 145,000; for domestic use, 2,290,000; refined products in bond, 1,530,000; for domestic use, 548,000. Total new supply, all oils, 120,071,000.

Demand. Total, 116,583,000; daily average 3,761,000; exports, crude, 6,692,000; refined, 9,457,000; domestic demand: motor fuel, 45,361,000; kerosene, 4,985,000; gas oil and distillate fuels, 9,957,000; residual fuel oils, 26,847,000; lubricants, 1,972,000; wax, 83,000; coke, 706,000; asphalt, 2,268,000; road oil, 526,000; still gas, 5,250,000; miscellaneous, 193,000; losses, 2,286.000. Total domestic demand, 100,434,000.

Timely subjects on East Texas A.P.I. program

A lively program has been arranged for the meeting of the East Texas Chapter of the American Petroleum Institute which will be held in Kilgore, Texas, on Tuesday evening, December 14, 1937. The subjects which will be discussed are very interesting to all oil men in the East Texas area for the reason that they are currently discussed and seriously considered at this time.

The first subject to be discussed will be "The Pressure Production Relationship in the East Texas Field" by J. S. Hudnall of Tyler. In view of the fluctuating pressure conditions in the East Texas reservoir it is believed that every one interested in the field will be glad to hear this subject discussed.

The next subject to be discussed will be "The Application of Liquefied Natural Gas to Petroleum Development and Production," by Albert E. Sweeney, Jr., of the Petroleum Engineering Department of the University of Texas. This paper will be mimeographed and distributed at the meeting because of the valuable data that is presented therein.

Warren L. Baker, editor of The Oil Weekly, Houston, will discuss "Current News in the Oil Industry" followed by a very instructive and entertaining moving pitcure, with sound, on the proper handling and care of sucker rods in the field. This picture will be presented by the S. M. Jones Company. It is a picture showing the progress and new developments in the manufacture of sucker rods, together with field engineering developments and the care and handling of sucker rods in the field.

Frank Carothers, of Norvell-Wilder Supply Company, will present a humorous discourse and if you have never heard this gentleman in action you have a surprise and a treat in store.

The meeting was formerly scheduled for the High School auditorium, however, the place of meeting has been changed to the Kilgore Heights School auditorium. The Kilgore Heights School is located west of the Kilgore Junior College, and west of the Federal Tender Board.

Papers on Illinois Basin to highlight A.A.A.S. meeting

Pennsylvanian Rocks and Oil Developments in the Eastern Interior Basin is the general subject around which the section of geology and geography of the American Association for the Advancement of Science has built is program for the afternoon of December 31 in the Claypool hotel, Indianapolis, Indiana.

Harold R. Wanless, associate professor of geology of University of Illinois, will lead off the program with a paper titled "Pennsylvania Studies in the Eastern Interior Basin." He will be followed by Clyde A. Malott, whose paper is titled "Pennsylvanian of Western Indiana." L. C. Glenn will then discuss the Pennsylvanian in Western Kentucky.

Other papers on the program follow: "Upper Pennsylvanian Section in the Illinois Coal Basin," by L. Marvin Weller and William A. Newton; "Recent Additions to Our Knowledge of the Structure of the Illinois Basin," by Alfred H. Bell and George V. Cohee; "The Age and Significance of the Kankakee Arch in Illinois," by G. E. Ekblaw; "Current Developments from Prospecting in the Illinois Basin," by C. J. Hares; "The Pennsylvanian Fusulinidae of Illinois," by C. O. Dunbar and L. G. Henbest; "Spores of the Pottsville and Higher Coals in the Eastern Interior Province," by James M. Schopf; and "Some New Aspects of the Michigan Basin," by R. A. Smith.

Dr. F. B. Plummer of the University of Texas will present a paper on "Oil Reservoirs" at the morning session December 31.

Geological fraternity bi-annual meeting

Austin.—The Eleventh Bi-Annual National Conference of Sigma Gamma Epsilon, honorary student geological fraternity, will be held at the University of Texas, Austin, Texas, on December 29, 30 and 31. All ex-members are invited to attend, and are urged to communicate with Gerald Bartley, president of the fraternity at the University of Texas, if they will attend.

On December 29 a preliminary field trip is planned during the afternoon. It will include a visit to the geologic features in the vicinity of Austin.

The morning of December 30 will be devoted to business of the national convention. In the afternoon a trip from Austin to San Antonio will be made. Geological features in some of the newer fields will be studied. Dinner will be at San Antonio.

The morning of December 31 is to be another business session. That afternoon the convention's business will be finished, and a tour of the campus will be made.

A banquet Friday night, December 31, will complete the program.

Hamilton litigation ruling December 15

One of the final steps in litigation involving Hamilton Gas Company, which has been pending in federal court at Charleston, West Virginia, since January, 1932, will be taken December 15 when Federal Judge George W. McClintic will hold a hearing on payment of claims for services and expenses totaling almost $600,000. The court last month gave final approval to a second amended plan of reorganization entered by E. McClain Watters, Philadelphia attorney representing the debenture holders committee.

Receivership proceedings against the company, which has oil and gas holdings in West Virginia and Kentucky, were instituted in 1932 and in June, 1934, with presidential approval of Section 77B of the federal bankruptcy act, the company filed a petition for reorganization. The company's assets, once worth about $10,000,000, are now estimated at about $2,000,000.

The United States Supreme Court has ruled on questions during the long, drawn-out litigation on two occasions—once when jurisdiction of the West Virginia court was disputed by a group favoring a New York court, and on the second time it refused to review the lower court ruling recognizing rights of stockholders and creditors to reorganize as opposed to the company officers.

Collusion lacking in Michigan crude cut

Charges of collusion or discrimination against independent Michigan operators by pipe line companies and refiners which were recently made by producers protesting recent crude price cuts were not supported by an investigation by Dr. R. A. Smith, Michigan state geologist, which was made at the request of the state conservation commission, Smith reported last week.

"I have interviewed representatives of every interested branch of the oil industry and found no evidence of collusion," Smith declared. "But I have found a great lack of understanding of the problems each faces. The producer can't see the refiner's problems, and the refiner can't see the producer's. And neither of them sees anybody else's problems."

His investigation, Smith said, convinced him that Michigan crude oil prices were reduced "at a time when the market was not strong, and the market has become weaker since then." The first cut was made to producers in the Arenac field, which yields an inferior grade oil, and later spread to other Michigan fields.

Michigan drive against fake oil promotions

The assistance of Michigan county prosecutors was solicited last week by Carl O. Olson, state corporations and securities commissioner, in his drive to stamp out promoters of fake oil and gas promotion schemes.

In a letter to prosecutors, Olson said: "The Michigan corporation and securities commission has resolved that its policy of preventing impositions on the public shall be transferred with greater effect into the oil and gas industry, and for that purpose earnestly requests your cooperation to the end that investors may not be deceived and that funds may not be misdirected, but invested in oil and gas corporations."

To study brine control

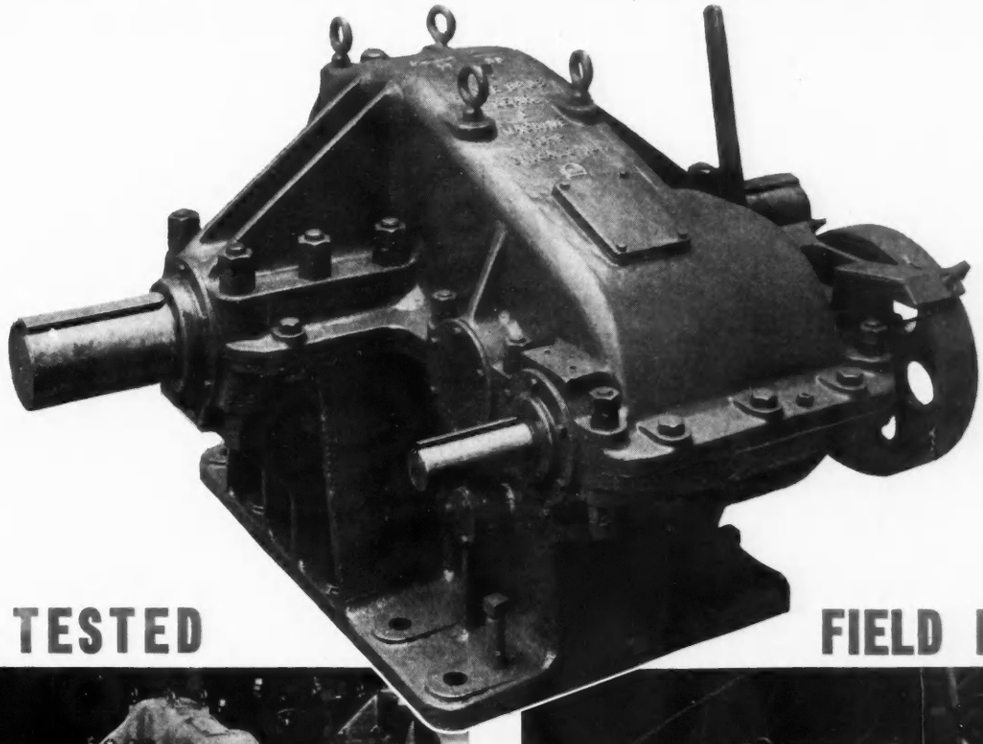
Mt. Pleasant, Mich.—The State Stream Control Commission has ordered 72 Michigan operators to Lansing December 13 to discuss ways and means of "immediately correcting and placing effective methods of brine control in operation."

Milton P. Adams, secretary of the commission, declared that "our surveys show general cooperation but considerable brine is still reaching and polluting streams." Adams said that while the 11-months-old Buckeye field is not now a major offender, that edge wells are producing brine in some quantities without effective control.

Kiowa lease sale

Anadarko, Okla.—Sealed bids on 150 tracts including 20,303.43 acres of Indian lands in Caddo, Kiowa and Comanche counties, will be opened at the Kiowa Indian Agency here December 16. Largest tract is in Comanche County, only land being offered there, comprising 165.39 acres in NE 6-4n-11w.

IXL REDUCTION UNITS



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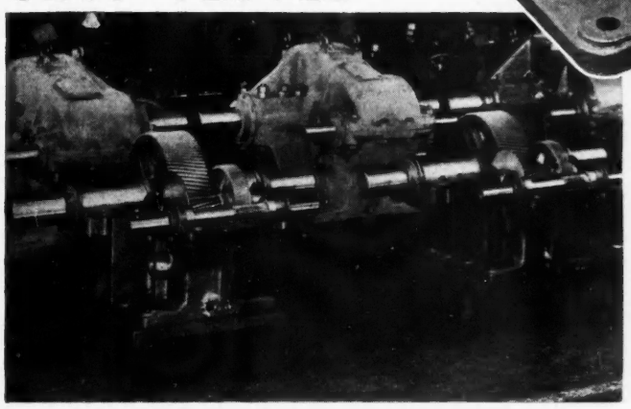

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Edited by
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Strike May Be Helium

Find high pressure, non-flammable gas in Hunter Valley structure wildcat coming up through 2000 feet of mud

DISCOVERY of an unburnable gas under high pressure at Hunter Valley Oil Company, Ltd.'s wildcat test on the Hunter Valley structure, Legal Subdivision 12, Section 13, Township 31, 10-w5, 65 miles west of Olds, Alberta, Canada, has aroused the interest of Provincial and Dominion officials because of the possibility that the gas may be helium. It came at high pressure through 2000 feet of rotary mud in the 8282-foot hole last week before the test was closed for the winter.

While it is quite possible that the gas may be carbon dioxide or nitrogen, strength to the theory that it may be helium or a mixture of helium and some other gas is given by the fact that the rare gas is found in small, but noncommercial, quantities in Turner Valley, whereas other unburnable gases are seldom found. Determination of the character of the gas, which came through the column of rotary mud in large bubbles, must wait until March when the wildcat will be reopened.

Before shutting down last week because of bad roads and heavy snow, 5⅝-inch casing was run to 6000 feet. R. J. McLaren, managing director of the company, announced last week that plans were being made to drill another well on the structure.

Inquiry to Start Soon

Hon. N. E. Tanner, Alberta minister of lands and mines, announced that provincial officials are assembling facts for a brief to be presented by the province when an inquiry into the oil situation in Alberta is made by the dominion tariff board. The inquiry, which has been promised as a result of the insistence of Turner Valley operators whose production is now held to 35 percent of potential, is expected to start immediately after the first of the year and will include a study of prices of petroleum and petroleum products and their effect on tariffs.

Despite the unfavorable crude marketing situation and undoubtedly because of the success of recent completed tests, operations in Turner Valley are increasing. New tests are being started as rapidly as equipment is released from completed wells, with occasional importation of new rigs making possible development at a slightly increased pace.

Flows While Drilling

National Petroleum Corporation's 1, Legal Subdivision 8, Section 29, Township 18, 2-w5, which stopped drilling for a production test a week ago 372 feet in the Madison limestone, was deepened to 431 feet in the Madison, 7217 feet being the corrected depth. It was flowing between 12 and 15 barrels an hour through six-inch casing during drilling with cable tools, but before the cuttings could be cleaned out the gas line supplying the boilers was frozen and a production test was delayed. Four tanks with a total capacity of 12,000 barrels were being erected to supplement storage of 3500 barrels previously provided.

Mexico City, Mex.—The government's verdict in the general petroleum conflict which is promised for December 18 at the latest is anticipated December 10 in oil circles to be favorable to the companies.

As a direct result of its agreement with the government regarding continued exploitation of the rich Poza Rica and two adjoining fields in Vera Cruz state, Mexican Eagle Oil company is arranging for intensified refining at its Ciudad Madero plant near Tampico. The program which it is expected will be initiated early in January contemplates hiring 2,000 more workers for the unit.

West Flank Oil Company's 1, Legal Subdivision 1, Section 32, Township 18, 2-w5, was reported on steady crude production following a recementing job which delayed completion two weeks. A production test was to be made this week.

Delayed several weeks because of inability to obtain storage tanks, a production test of Commoil's 1, Legal Subdivision 15, Section 29, Township 18, 2-w5, west of all present completed tests in Turner Valley, yielded 2441 barrels in 48 hours. The flow, of which 1278 barrels came during the first 24 hours and 1163 barrels during the second period, was through 6⅝-inch casing, with no tubing installed and with no back pressure. Tubing is being installed and preparations are underway to give acid treatment, after which the well's potential will be established for proration purposes.

Flank Test Spuds

Outstanding among the week's new operations was spudding in of Mid-Royal Oils' 2 on the most southerly point of the west flank of Turner Valley yet to be tested. On Legal Subdivision 3, Section 9, Township 18, 2-w5, it is more than a half mile south of National Petroleum Corporation's 2 and about ¼-mile south of Highwood River. Also in the southern portion of the west flank, Okalta Oils announced Nos. 7 and 8. Cellar for No. 7 has been dug on Legal Subdivision 3, Section 16, Township 18, 2-w5, and a new steel derrick sent out to the site. Cellar is being dug for the No. 8 on Legal Subdivision 6, Section 16, Township 18, 2-w5.

Battleview Wildcat

On the Battleview structure, 22 miles northeast of Wainwright, Battleview Oils has erected a derrick on Legal Subdivision 10, Section 32, Township 47, 5-w4, for No. 2, which will be drilled with rotary equipment from South End Petroleums' test west of Turner Valley. The South End test is temporarily abandoned. The Battleview Company's 1, a wildcat on the same section as No. 2, encountered a sensational flow of gas several weeks ago and it is now waiting at 1894 feet.

Operations on a number of wildcat structures will be closed down for the next three months because of cold weather and poor roads.

Other Canadian Wildcats

The following reports were received from other Alberta wildcat structures last week: On Birch Ridge, Elbow Oil Company, drilling at 5252 feet; on Calling Valley, Sentinel Oils, drilling at 6102 feet; Anglo-Indian Oils Corporation, derrick up; on Cardston; Franco Oils, waiting at 4580 feet; on Clearwater, Western Development Company, idle at 142 feet; on Del Bonita, Lyons-McIntyre, waiting at 420 feet; on Duncan, Spindletop Oils, drill-

ing at 2315 feet; on High River-Aldersyde, Ranchmen's Oil Company, resuming from 7225 feet; on Highwood-Sinclair, Green Valley Petroleums, Banner 1, drilling at 4700 feet; on Kootenay Dome, Roxana Petroleums, drilling at 3722 feet; on Lethbridge, Lethbridge Petroleum & Refineries 1, cemented at 2198 feet; on Moose Dome, Moose Oils' 2, testing at 1553 feet; Model Oils 1, drilling at 182 feet; on New Valley, New Valley Oil Company, waiting at 8462 feet; on Pincher Creek, Weymarn Petroleums' 2, waiting at 8462 feet; on Ribstone, Dina Oil & Refining Company's 4, drilling at 1033 feet; London-Ribstone Petroleums' 2, testing with no depth reported; on Steveville, Anaconda Oil Company, waiting at 1207 feet; on Taber, Plains Petroleum Corporation's 3, casing at 3106 feet; Amerada Oil Company, derrick up; on Watson, Mar Jon Oil Company's 3, waiting at 5520 feet; No. 5, cellar; Mar Jon-Maxmont Syndicate 4, drilling with no depth reported; on Wainwright, Altoba Oils, derrick.

On Sage Creek in British Columbia, Columbia Oils is making good progress. Drilling was below 6504 feet at the last report.

Thirty-nine new Canadian oil firms

Thirty-nine new companies have been organized in Alberta, Canada, since August, 1935, to engage in oil development, according to a report issued last week by the Provincial Lands and Mines Department. They have a total capitalization in excess of $10,000,000. More drilling has taken place in the Province during the first 11 months of this year than in all of 1935. Crude production is now at the rate of 7,000,000 barrels a year, or more than twice as high as the corresponding period of last year.

The report credits regulations made by the "Social Credit" government to encourage development for the large influx of United States and European capital for drilling enterprises during the past year.

Canada to curb waste of gas in Turner Valley

What has been described as "criminal" waste of natural gas in Turner Valley, Canada's largest oil field, may be curbed within a month with a shutdown of 75 naphtha producers now taking 200,000,000 cubic feet of gas daily from the field. Steps toward conservation of gas pressure were taken recently by Provincial government officials and by the Petroleum Producers' Association.

N. E. Tanner, provincial minister of lands and mines, in Calgary last week, said definite action towards gas conservation may be taken within a month's time. A study of the mechanics and economics of the problem are being studied by the government.

"We feel that it will take three weeks to a month to get all information before we know just what action to take," Tanner said.

Officials of the producers' association announced, meanwhile, that a majority of the crude producers and naphtha producers have agreed to the organization's conservation plan which provides 100 percent compensation to naphtha well owners for loss of revenue while their wells were shut down. The compensation, which would approximate $1,000 daily, would be made by Turner Valley crude producers and Calgary Gas Company.

Crude producers would profit by the plan by virtue of an assurance that gas for crude wells would not be drained from crude oil territory, while the gas company would benefit by an assurance that Turner Valley would have a much longer life if gas wastage were halted. At present, 74 percent of the gas produced in the field is wasted through operation of the naphtha wells.

Rapidly declining gas pressure in Turner Valley is of great concern to crude operators as few of the present wells are in a condition that would readily permit use of mechanical means of lifting the crude to the surface. Many of the holes are crooked.

WORK ON CONCESSION IN HAITI TO START SOON

Preliminary exploratory work is scheduled to get underway fully in December on a 500,000-acre concession obtained by Clem Clark of Shreveport, Louisiana, in Haiti in Santo Domingo and turned to Skelly Oil Company and Pacific Western Oil Corporation for development.

Clark retains a quarter interest, with Skelly holding a 50 percent interest and Pacific Western 25 percent. Operating expenses will be shared by the two companies.

A skeleton crew is being formed to establish a seaport office and field camp in the province of Azua, location of the concession. Field manager for the development is M. W. Mathews, assistant field superintendent at Oklahoma City, who is picking the men to do the advance work.

Company officials believe the area is on a direct trend from eastern Venezuela. This contention is reported agreed upon by numerous geologists familiar with the area, who also state other islands of the West Indies may have producing possibilities. Eastern Cuba and Puerto Rico are also reported in line for surveys in the near future regarding possible productive areas.

Germany's agent authorized to export helium for ship

American Zeppelin Transport, Incorporated, New York, agent for German Zeppelin Company, December 6 was authorized by the state department to export 17,900,000 cubic feet of helium for use in inflating a new zeppelin, the LZ-130, thus paving the way for resumption of experimental dirigible flights between Germany and the United States. Previous attempts to use hydrogen gas for inflating the dirigibles have proven disastrous.

Only One Plant

The only large scale helium producing plant in the world is owned and operated by the United States Government in the Texas Panhandle. The plant is located about 5 miles west of Amarillo, and has been in operation since 1929. Natural gas processed by the plant for the extraction of helium is derived from the Cliffside structure, Potter County, located south of the buried granite ridge that is largely responsible for the accumulation of oil and gas in the district.

Gas produced from the Cliffside structure yields about 1.6 percent helium per 1000 cubic feet of gas, and is virtually isolated from other gas areas in the district, thus accounting for the fact that the rock pressure is about 300 pounds greater than the average recorded by the huge gas reserve.

Originally the government plant operated on gas supplied by the Amarillo Oil Company, and the residue was returned to the company to be marketed with its non-helium content gas. In July, 1929, the government purchased gas rights under 20,000 acres of land, embracing the helium source, and drills additional wells as needed to maintain an ample supply of gas for the plant.

Santillan and finance minister here to buy

Mexico City, Mex., Dec. 10.—Determined to exploit the national petroleum reserves to the fullest extent to assure abundant oil supplies for government organizations and domestic consumption, the General Administration of National Petroleum, the official oil company of the Mexican government, is arranging an intensive working of these tracts, and to that end it has sent its Director Engineer Manuel Santillan, accompanied by Finance Minister Eduardo Suarez, to the United States to purchase machinery and equipment for the undertaking.

Trinidad production

Production of crude oil in Trinidad, British West Indies, during October amounted to 1,390,720 barrels, according to word from R. S. Mackilligan, inspector of mines and petroleum technologist.

MEXICO

Completions

(OCTOBER)

Company, Well and Location	Init. Prod. Bbls.	Depth
Mexican Eagle, El Plan 65, El Plan, Minatitlan, Vera Cruz	2202	3102
El Plan 63, El Plan, Minatitlan, Vera Cruz	246	2735
Cia. Carbonifera de Ciudad Mier, S.A., Williams 2, C. Mier, Tamaulipas state	¶2½	1255
General Administration of National Petroleum, Petromex 42-a, Buena Vista, Panuco, Vera Cruz	95	2220
Southern Fuel & Refining, Cacalilao 366, Cacalilao, Panuco, Vera Cruz	*	1980

*Failures; †Junked; ¶Million cu. ft. gas.

C. N. Robinson Elected Head of Petroleum Electric Power Club

ELECTION of officials and reports of standing committees completed the annual meeting of the Petroleum Electric Power Club at Shreveport January 10.

Officials are C. N. Robinson, Oklahoma Public Service Company, Tulsa, president; O. W. Jones, Central Power & Light Company, Corpus Christi, vice president; H. E. Roberts, Empire District Eelectric Company, Joplin, secretary-treasurer.

Directors for the 1938-39 period are: W. H. Stueve, Oklahoma Gas & Electric Company, Oklahoma City; H. E. Roberts, George H. Weckel, Kansas Gas & Electric Company, Wichita; F. A. Graham, Kansas City Power & Light Company, Kansas City; J. E. Elliott, Southwestern Gas & Electric Company, Shreveport; E. A. Armstrong, Public Service Company of Northern Illinois, Chicago.

Problems Discussed

The program of the first day of the meeting was devoted to papers and discussion on methods of bringing the electric power industry into closer service and sales relationship with the petroleum industry.

Proposal of the federal administration to create seven power authorities, similar to TVA, was outlined by A. B. Morgan, Edison Electric Institute, New York. He pointed out that building of hydro-electric plants was but one of the possibilities of the legislation now pending.

One of his points was that these commissions would have authority to withdraw substantial lands and to provide physical facilities, all which would be removed from taxation because the ownership would be vested in the federal government.

Advantages of purchased electric power in oil production was introduced by R. E. Patrick, Kansas Gas & Electric Company, Wichita. His paper consisted of case instances of how his company had been able to solve production problems, either through introduction of electric power or by alterations in equipment so electric power costs were reduced, especially in pumping oil wells.

His version of the solution of the problem of selling purchased power was that the power companies must be able to provide energy which is either cheaper or more satisfactory than other power sources.

Discussion covered the many problems of providing purchased power, with cost frequently injected as a barrier. The fact that cost of installing lines and plant capacity often leaves it undesirable for the power industry to undertake available sales was also brought out. Several made a point of the fact that the cost of electric power as compared with other power, is not the final test as to cost, since savings in operating under electric power must have consideration. Provision of electric power through private generating plants was accepted as a favorable trend, since it gives evidence that the petroleum industry is turning to electricity as a source of energy in lease operating.

Lack of variable speeds in ordinary squirrel cage motors was cited as one of the needs in enlarging the use of electricity in pipe line pump stations by F. A. Graham, Kansas City Power & Light Company, Kansas City. He was quick to introduce profit into the pump station problem, as he said pump station loads are not desirable to power companies unless they offer a profit, while use of electricity is not desirable to the oil industry unless it promises a cheaper method of pumping.

As to the future of electric power in pipe line stations, he said new construction did not offer much encouragement for the next year in the Mid-Continent. Therefore, he advised the power industry to look to increases in pump station capacity and to replacement in prime mover energy where stations must be rebuilt. He said the power industry should cease to consider main line pump station installations as having life not to exceed five years.

One of the developments for the future, as presented by Graham, was that natural gas compressor stations will come to the use of electric motors with perfection of the centrifugal compressor station, which is not in the experimental stage.

K. K. Kreamer, Houston Lighting & Power Company, Houston, pointed out that less than one percent of the prime mover power within the refining industry is by electric motors. Presence of steam for other purposes and existence of gas from refining process work against other requirements for energy in refining.

The trend toward use of still gases for cracking was cited as a trend, which will give makers of electric power opportunity to increase sales to refining plants.

Taxes on independents aired at Abilene

POSITION of the independent oil men on tax burdens were aired before a large gathering of state officials present at the annual meeting of the West Central Texas Oil & Gas Association held at Abilene, Texas, December 4. The organization has forged to the front as one of the most active independent groups within the state, and is harmonizing its efforts with other bodies in dealing with legislative and taxation matters. Approximately 700 attended the banquet, including about 3 members of the Texas legislature.

Taxes have become a major problem for the oil industry, according to J. C. Hunter of Grisham-Hunter Corporation, Abilene, president of the association. He stated that when the oil industry is adversely affected that it soon reflects in general business.

Hunter praised the activities of the Texas Railroad Commission in dealing with the oil industry, and pronounced the current relations as being excellent.

Chas. F. Roeser, president of Roeser-Pendleton, Inc., and head of the Independent Petroleum Association of America, said 42 percent of the state income was derived from taxes imposed upon the oil industry, and that it was absorbing its share of the burden. He defended oil proration against charges that it caused higher gasoline prices. Storing of excessive stocks of oil products during over-production in former years added about 30 cents per barrel to the cost of crude.

Colonel E. O. Thompson, member of the railroad commission and chairman of the Interstate Oil Compact, sounded a cheerful note in forecasting a 6 percent gain in the demand for petroleum products during 1938.

Membership of the West Central Texas Oil & Gas Association relected all officers, including A. J. Frazier, Abilene, first vice president; Ralph G. Fleming, Albany, second vice president; and Edward King, Abilene, secretary-treasurer.

"State control near," Calvert

C. A. Calvert, president of the Oil and Gas Association of Michigan and attorney for Pure Oil Company, Michigan division, in reviewing the year at the annual association meeting December 7, said, "It would appear that the time is rapidly approaching for state oil control."

Bills that would have made state control have been defeated in the past two sessions of the legislature. Ineffectiveness of voluntary proration in the Buckeye field this year is expected to be an important wedge in an almost certain association-backed bill in the new session.

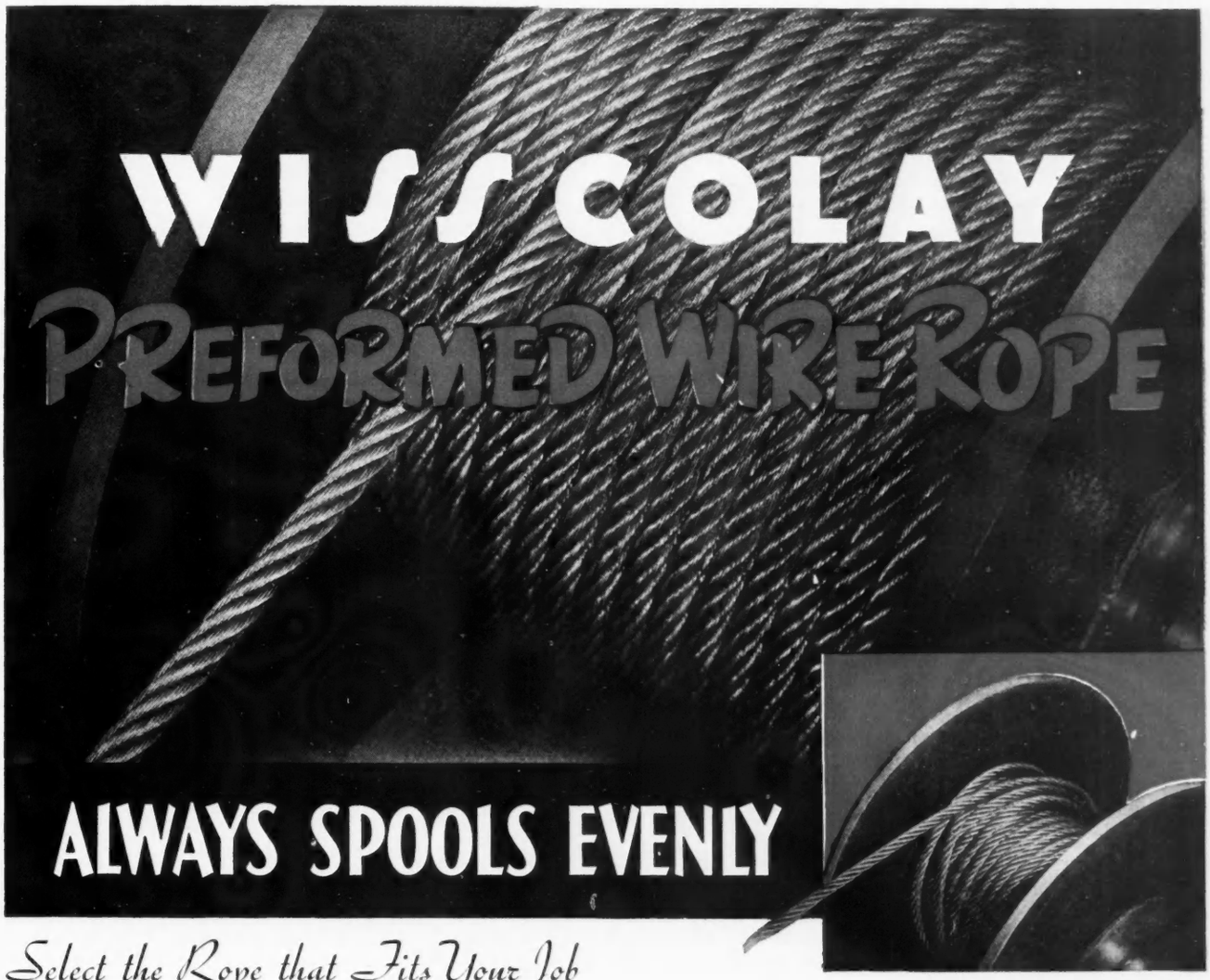
Directors named for two year terms, who will meet with the 11 hold-over directors in Saginaw, December 15, to elect officers for the year, included Calvert; Crawford Daily, Daily Crude Oil Company; Haswell Grant, attorney; James C. Graves, Goll-Graves-Mechling, Incorporated; Isiaah Leebove, president Mammoth Producing & Refining Corporation; J. W. Leonard, Jr., Leonard-Cryden-Rowmor group; George W. Myers, Sun Oil Company; Karl Schilling, Shell Petroleum Corporation; Joe Drury, Whitell & Drury; Harold McClure, Rex Oil Company; and J. W. Wicklund, Wicklund Development Company.

Proration

[*Continued from Page 13*]

for the allocation of proration quotas was requested by operators at a hearing. Witnesses testified that other fields in the district are virtually on a marginal well basis, and that the deep zone involves drilling costs that must be recognized in fixing the allowable, which is currently limited to 58 barrels daily per well.

Economic danger of over-drilling the K-M-A field, which produces from the Strawn sand and sandy-lime series near



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the 3900-foot level, is generally recognized. Heretofore operators have adopted a 10-acre well spacing plan, but with from 30 to 50 square miles of probable producing acreage slated to be developed a wider interval between wells is deemed necessary.

Recommendations were made to the commission for the adoption of 20-acre units, with a proration quota of 80 barrels daily per well, including 40 barrels marginal allowance, and an equal amount for acreage. Wells drilled on 10-acre units would be restricted to 60 barrels daily, with only 20 barrels earned by the acreage factor. Wells on 5-acre sites would receive their 40-barrel marginal quota, plus 10 barrels for acreage, making a top allowable of 50 barrels. The sponsors of this method of allocation foresee danger of widespread subdivision of leases in the prolific section of the field in order to drill more wells, and a small scale repetition of the excessive drilling underway in the East Texas field, where a production premium is placed upon well density.

Oklahoma City allowable adjustment refused

Application of Natural Gas Development Corporation for adjusted allowables on the Westgate Carey lease in the Oklahoma City oil field was denied last week by the Oklahoma Corporation Commission, when it voted to sustain the demurrer of Earl Foster, conservation attorney.

Adjustment of the allowable, through which the company sought to have held invalid all proration orders covering the Wilcox sand zone of the field from December 1931 to the present, would have given the company approximately 600,000 barrels back production. A. S. J. Shaw, commission member, stated he would sign the order when it was prepared but refused any comment concerning the decision.

Because of the high rate allowed marginal wells, the company's petition claimed its larger wells on the lease were being penalized, with smaller wells gaining the benefit. Asserting the original orders for the Wilcox zone there fixed a minimum allowable of 50 barrels per day, the petition further stated this rate was increased to 100 barrels daily, and in May of this year was raised to 300 barrels per day. The figure was cut to 250 barrels daily during November and December and the company pointed out further reduction would make operation of many of their wells unprofitable.

One official of the commission stated such an order, were it passed, might easily put those companies operating only a few minimum wells out of business.

Recess Montana hearing

Following a week of hearings at Great Falls, the Montana state oil conservation board recessed on December 4 until January 4. The recess was forced by press of business upon leading figures in the inquiry, it was explained. During the first week, testimony was taken on the Kevin-Sunburst field from proponents of proration. Testimony from those seeking proration must still be taken on the Cut Bank and Pondera fields as well as testimony from opponents on all fields.

PIPE LINE NEWS

Gas for Chattanooga involves construction of 80-mile line

Construction of an 80-mile natural gas pipe line is called for in a proposal to distribute natural gas in Chattanooga, Tennessee, in place of manufactured gas now sold. The first step toward bringing in natural gas was taken last week when the Chattanooga city council passed on first reading an ordinance granting the Chattanooga Gas Company a new franchise valid for 40 years. The new franchise would replace one which expires in 16 years and is sought as a matter of prudence because the change would involve an expenditure of $1,500,000 in pipe line construction and changes in the distribution system, A. J. Goss, manager of the company, announced.

The natural gas would probably be obtained from the Southern National Gas Company, Goss explained, but declined to say whether a contract had been entered into between the two companies. Southern Natural lines run as far as Rome, Georgia, but facilities to this point are not adequate and it would be necessary to go to Cedartown, Georgia, for a supply. The franchise ordinance was introduced by Mayor Ed Bass.

Lone Star to give gas outlet to Buffalo field

Dallas.—Lone Star Gas Company will start construction work shortly on 19 miles of 18-inch welded natural gas line to link the Buffalo gas area, Leon County, with its East Central Texas system. The project is scheduled to be completed by mid-January. It will extend north from the field to a point east of Buffalo, where connection will be made with a 12-inch line that delivers gas from the Lone Lake field to the company's system near Waco.

Lone Star Gas Company acquired operating control of the 3 prolific gas wells in the Buffalo area early last summer, and is obligated to drill 4 additional wells. Shell Petroleum Corporation and 7 associated companies and individuals drilled the gassers in 1933-34 on unitized acreage, but could not obtain a market for the production.

Lone Star to buy West Texas gas lines

Dallas.—Lone Star Gas Corporation has been authorized by the Securities Commission to purchase natural gas systems and electric power units operated in West Texas by the Texas Public Service Company, Texas Public Service Production Corporation and West Coast Power Company for $1,762,000. The deal involves a 70-mile 8-inch trunk line that delivers natural gas from fields in Coleman County to San Angelo, Rowena and Miles, and a 74-mile 12-inch carrier that supplies the electric plant at San Angelo with gas produced in the Big Lake field, Reagan County. A 44-mile 8-inch line that formerly served an electric plant at Girvin, Pecos County, with Big Lake field gas is also included.

The deal is scheduled to be concluded late this month. The natural gas transmission facilities will be taken over by the Lone Star Gas Company, subsidiary of the purchaser, while the franchises and distribution systems will be operated by the Community Natural Gas Company, also an affiliated unit. Lone Star Gas Company supplies all important towns to the northeast and north of San Angelo with gas, and may revamp its system in this section of the state.

Philadelphia gas line appears unlikely

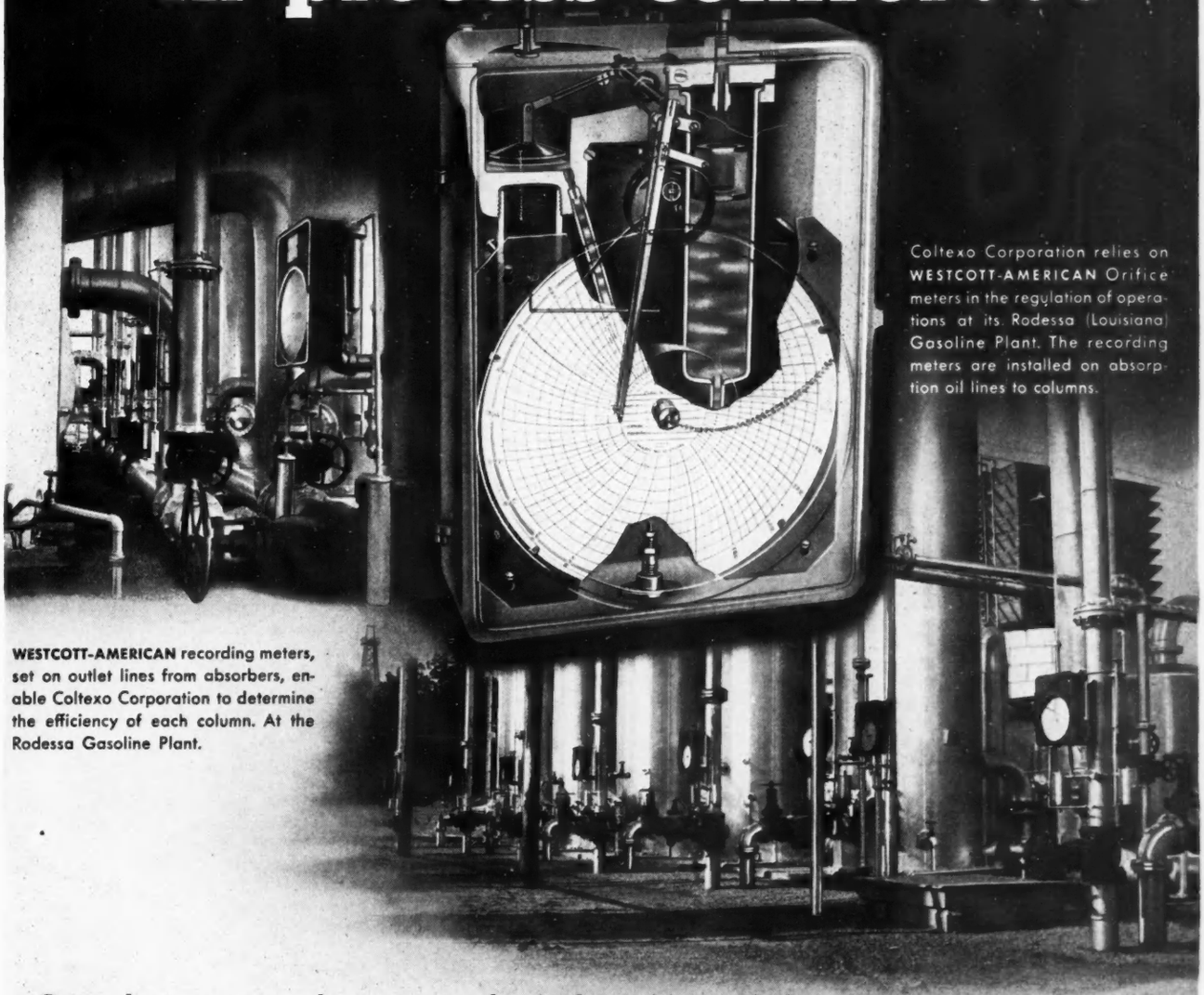
Philadelphia.—Mayor S. Davis Wilson of Philadelphia, who has announced his candidacy for governor of Pennsylvania with "soak the oil industry" as a plank in his platform and who has substituted coal stokers for oil burners in many Philadelphia public buildings, last Tuesday announced he would veto the use of natural gas in Philadelphia.

The announcement climaxed a controversy that has raged in Philadelphia and Harrisburg for months concerning operation of the city-owned gas plant after December 31 when a lease contract held by United Gas Improvement Company expires, and directly followed a session between the mayor and delegates of miners and merchants from the Pennsylvania anthracite region.

The mayor's stand will probably postpone for many years the possibility of bringing natural gas from Oriskany fields in northern Pennsylvania to the Quaker City, as it appears extremely doubtful that sufficient support for natural gas can be raised among members of the city council to override a veto. It appears to kill the proposal of John T. Cunningham, Rixford natural gas operator, to supply natural gas at a price approximately half now paid for the manufactured product.

With immediate state approval for construction of pipe lines from the fields to Philadelphia doubtful because of the antagonistic attitude of Governor George H. Earle, Cunningham proposed to supply the manufactured product until arrangements to bring in natural gas could be completed, his

Measurement engineering in process control . . .



Coltexo Corporation relies on **WESTCOTT-AMERICAN** Orifice meters in the regulation of operations at its Rodessa (Louisiana) Gasoline Plant. The recording meters are installed on absorption oil lines to columns.

WESTCOTT-AMERICAN recording meters, set on outlet lines from absorbers, enable Coltexo Corporation to determine the efficiency of each column. At the Rodessa Gasoline Plant.

● **Each meter application in the Oil and Gas fields, has its own peculiar demands upon measurement engineering and technology. Take for example, the metering of heavy, viscous oil or of gasoline.**

It is the scrupulous regard for meter accuracy . . . under every field operating condition . . . that has established a world-wide reputation for the WESTCOTT-AMERICAN trade name. Complete descriptive and technical literature available for Indicating, Recording, and Integrating meter installations.

887

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AMERICAN METER COMPANY

INCORPORATED

Measurement and control of Gas, Oil, Steam, Air and Liquids

METRIC METAL WORKS *ERIE, PENNSYLVANIA*

contract with the city to provide that this be done within five years.

Further, Mayor Wilson announced last week that if the city council passes an "unsatisfactory" lease agreement with some other company or individual, he would veto it and let the United Mine Workers of America, a C.I.O. affiliate, run the plant, with executive details to be handled by his gas experts.

Union relocating six miles of oil line out of Norwalk

Sacrificing valuable rights-of-way in order to foster the further development of the north central section of Long Beach as a residential district, Union Oil Company of California is relocating one of its main pipe lines from Norwalk to the Harbor entirely outside the subdivided area. The project involves removal of about six miles of the present pipe line from the residential area and installation of a new, eight-inch line west of the Flood Control Channel, in the west side of Long Beach. Installation of this new pipe line, between Anaheim and 223rd Streets, is nearing completion and the existing pipe line link will be removed soon, according to company officials.

Rodessa outlet

Shreveport. — Layton Oil Company has completed one 4-inch line from its E. S. Terry lease, Section 14-20-28, in the Miller County, Arkansas, part of the Rodessa field to the Kansas City Southern Railroad, a distance of 2½ miles, and is preparing to lay another line of the same size. The company is building two 10-car loading racks at the railroad end of the line. Handling of oil will begin when a market outlet is found and a 5000-barrel tank is completed. It is planned to build 40,000 barrels of storage tanks on the lease. William Monroe Layton, president of the concern, said the facilities would be available to any operator. Layton's present runs of 600 barrels daily from three wells are being handled by Southern Liberty Pipeline Company, but the three wells are making over 1500 barrels daily. It is this excess quantity that will be handled through the new systems.

Complete gas line

Cities Service Gas Company has completed laying 47 miles of 12-inch line from the Fitts field of Pontotoc County to the 16-inch main line at Seminole. Eight and one-half miles of 10-inch line has been laid from the Edmond pool and connected with the company's system in the Oklahoma City field, and is in operation. The lines were laid to provide more gas for the winter demand.

Rules condensate not subject to gasoline tax

In a decision handed down by the Texas Supreme Court last week, it was held that "condensate" should not be taxed as "gasoline."

The court held that, since evidence was presented in the trial court showing that the oil was not used as motor fuel and was apparently crude oil, the product would not be subject to the same tax as gasoline processed in a refinery.

Fox deep test drilling after having slight oil show.

* * *

Canyon lime well in West Frederick swabs 328 barrels.

* * *

Stephens County wildcat standing with oil in hole.

Tulsa.—Oklahoma was in the doldrums last week, but manager to come through with several interesting items. Eyes of oil men continued to focus on Southern Oklahoma, especially the deep Fox area, where the latest "hopeful" drilled out of the Oolitic lime.

Gulf Oil Corporation's Johnson 1, CSW NW 27-2s-3w, in the Fox area of Carter County, drilled and cored ahead, going out of Oolitic lime at 7955 feet. A core from 7940 to 7950 feet had a recovery bearing a light show of oil in Oolitic lime. A second core, from 7950 to 7960 feet had gray Oolitic lime in the upper portion with no show. It was to drill ahead.

In the West Frederick area of Tillman County, Indian Territory Illuminating Oil Company and Foster Petroleum Company's Dickey 1, SEc NW 1-3s-19w, latest Canyon lime producer for the area, swabbed 328 barrels of oil from the formation during latest tests. It was to be put on the pump, and tubing and rods were being moved in.

West of Frederick, an old wildcat, shut down since 1935, is to be drilled ahead in the hope of finding production in the Canyon lime. It is Barney Cockburn's Nichols 1, SEc 28-2s-19w, originally drilled by Cockburn and others. The test was not carried to the recently discovered lime. Work is scheduled to start about January 15.

M. B. Blake's Abernathy 1, NE SE SE 35-6n-10w, at the west end of the Cement pool of Caddo County, was abandoned last week at 5098 feet. There were no shows reported.

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Oklahoma City Sector

A gas blowout similar in some respects to that which re-opened the Doyle area of Stephens County, occurred in the Lovell area of Logan County last week. Sinclair Prairie Oil Company's Knecht 1, NW SE NE 28-18n-4w, drilled to 4240 feet, and at 3500 feet shot the pipe loose. When the casing was raised 14 feet, the well blew in for approximately 40,000,000 cubic feet of gas and some salt water, coming from the Tonkawa sand. A show of gas and water was reported from 4051 to 4061 feet. The company is attempting to mud off the gas.

In the southeast corner of Logan County, The Texas Company's Roper 1, CW/2 SW SE 22-15n-1e, was abandoned at 5542 feet in the second Wilcox sand. It had top of the formation at 5530 feet, and at the total depth cored blue, salty sand. Water was found in the first Wilcox.

An important new wildcat is being started in the Pleasant Valley area of Payne County. It is Sagamore Oil Company et al's No. 1, SE SW NW 17-18n-1e. Nearest production is 6½ miles southwest in the Langston pool of Logan County.

Tulsa District

In the Centrahoma area of Coal County, Carter Oil Company et al's Claytor 1, CW/2 NE SW 27-2n-9e, was preparing to take a drill stem test at 6715 feet. A core from 6710 to 6715 feet had a recovery consisting of 6 inches of gray dense, 2½ feet of gray Dolomite and one foot of Wilcox sand, which tasted salty. The well was reported showing some mud, a little gas and no salt water.

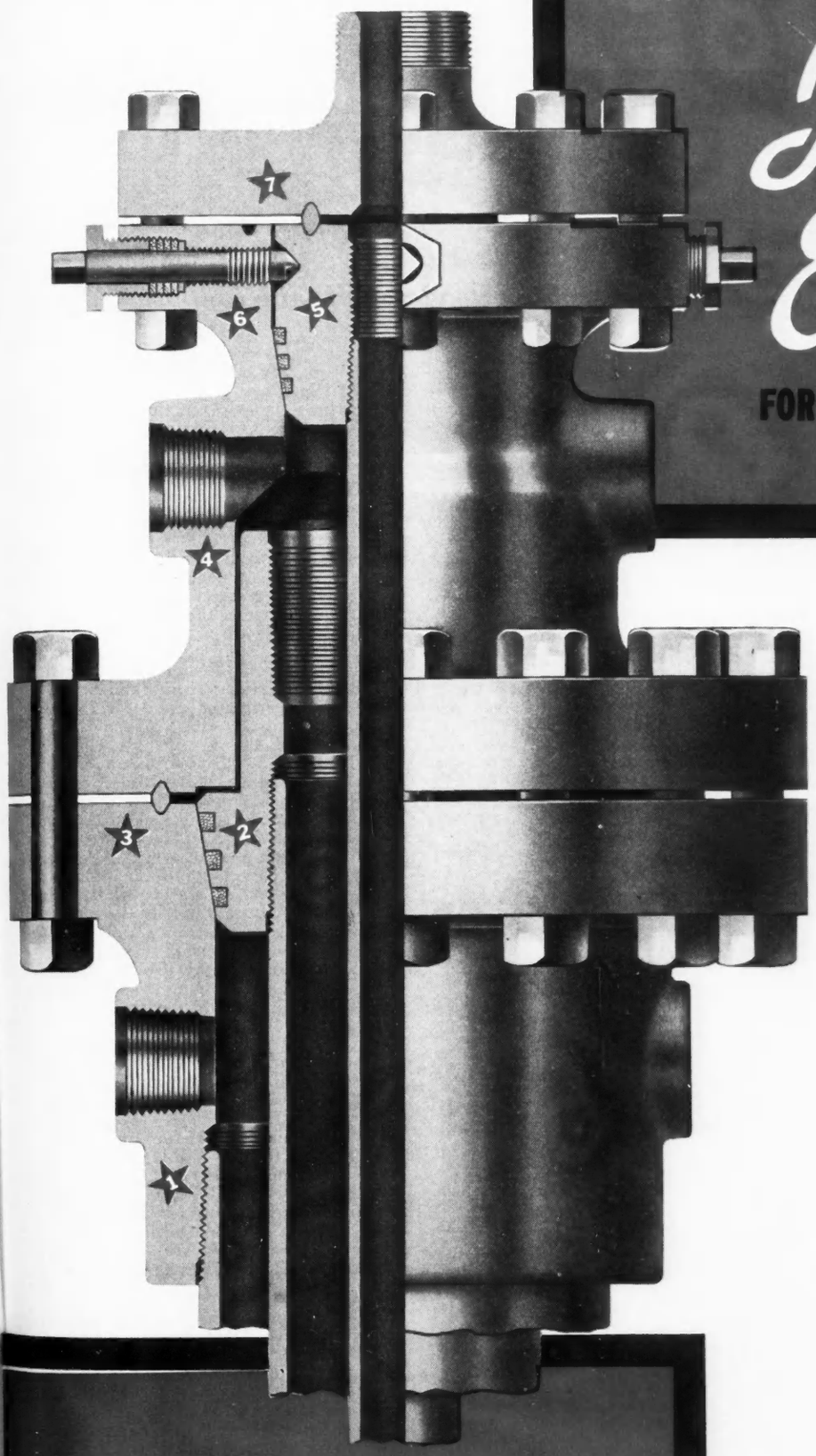
The new Hunton lime producer for Seminole County, Magnolia Petroleum Company's Reed 2-A, SE NW NE 26-5n-7e, reported a 10-hour production of 1085 barrels of oil, accompanied by 3,000,000 cubic feet of gas. It is at a plug-back depth of 4070 feet. A new test for the area will be The Texas Company's Jefferson 4, SW NE NE 26-5n-7e, an east offset to the new producer. It was a location.

At the north end of the West Earlsboro pool in Pottawatomie County,

DREADNAUGHT TYPE "HZX" COMBINATION CASING AND TUBING HEAD

It's got Everything!

FOR DRILLING AND COMPLETING *UNDER PRESSURE*



THIS combination casing and tubing head is designed for use with blowout preventer equipment to facilitate all drilling and completion operations under pressure.

1. The full-opening body of the casing head section passes regulation size bits and permits the running and landing of casing through blowout preventer equipment installed above the body.

2. Inner casing string is suspended from a tapered hanger which passes through blowout preventer equipment, seating and packing off in the tapered bowl of the body. This hanger is furnished threaded as shown, or for welded casing if desired, being designated as type "HZW."

3. API ring joints are provided between the A.S.A. series 900 flanges.

4. Tubing Head flow outlets are available threaded for line pipe as shown, or flanged with API ring joints between flanges.

5. The well is drilled in and tubing is run and landed through blowout preventer equipment installed above the tubing head section. Tubing is suspended from a tapered hanger which passes through the blowout preventer equipment, seating and packing off in the tapered bowl of the body.

6. The tubing head section is furnished with either four or six hold down set screws as shown. These set screws, each provided with a stuffing box, are backed out until the tubing hanger is seated and are then screwed into a slot provided in the hanger to seal in the well. After the hold down set screws are made up, blowout preventer equipment can be removed in safety and Christmas-tree installed. This head is also available without hold down set screws, being designated as type "HZP," for use where there is little or no pressure on the well.

7. This head is furnished as shown with a ring joint between the top of the tubing hanger and bonnet, or with an API ring joint between the top tubing head flange and bonnet.

BEAUMONT IRON WORKS CO.

BEAUMONT, HOUSTON, DALLAS, LONGVIEW, ODESSA, TEXAS AND TULSA, OKLAHOMA

"Selling Through Frick-Reid Stores Everywhere"

Atlantic Refining Company's Billington 1, NW NE SW 12-9n-4e, was completed for a potential of 120 barrels of oil, flowing for 24 hours through 3/16-inch choke. Production was from 4229 feet in Hunton lime. Packer was set at 4219 feet.

In the Wellston area of Lincoln County, Summitt Drilling Company's Thomas 1, NEc NW 2-14n-2e, filled 2000 feet with oil from 5060 feet in the Wilcox sand and was to be acidized before drilling ahead. It had top of the sand at 5058 feet. Simpson dolomite was found from 5049 to 5058 feet.

Outlook Improved

Despite trouble with casing which collapsed at 8689 feet, outlook for Coline Oil Company's Johnson 1, SW SE NE 1-2n-8w, northwest of Marlow in Stephens County, was considerably improved late last week with reports that 4000 feet of fluid was standing in the hole, half of it oil. The fluid level was reported to be at 7000 feet, with the oil testing 39 gravity. Operators were continuing efforts to remove the casing obstruction. Depth is 9164 feet. It was originally drilled to 10,001 feet, the fourth deepest test ever drilled in Oklahoma.

OKLAHOMA Completions

Company, Well and Location	Init Prod. Bbls.	Depth
BECKHAM COUNTY—		
Consolidated Gas Co., Knicely 2, cnw sw 10-9n-26w	¶27	3585
BLAINE COUNTY—		
Blaine Co., Dev. Co., Masters 1, sw nw ne 27-16n-11w (otd (1312)	*	1433
CARTER COUNTY—		
Magnolia, Pollock 1, sw sw se 14-1s-3w	*	4692
KOT Oil Co., G. A. Ramsey 2, se se nw 36-4s-2w	26	2475
Neff & Godfrey, Mobley 1, se sw se 13-4s-3w	1	1238
CLEVELAND COUNTY—		
Fain Drlg. Co., Gross 1, sw sw nw 22-10n-2w	*	7529
CREEK COUNTY—		
Magnolia, Tiger 3, sw nw se 17-17n-7e (otd 2375)	*	2869
Fred B. Kroger, Grayson 3, sw ne se 20-18n-9e	*	3005
L. B. Jackson, Jones 1, nw nw se nw 8-16n-11e	25	1959
Carpenter et al, Burgess 2, sw sw nw sw 30-18n-11e	12	1744
Sooner O&G, Colbert 1-B, nw ne se 8-18n-12e	¶1	1979
GARVIN COUNTY—		
Cox & Hamon, Marsh 1, sw sw sw 32-1n-3w (pb 3325)	130	3525
GRADY COUNTY—		
T. H. McCasland, Ray Horton 4-A, ne nw nw 8-3n-5w	¶4	1868
JEFFERSON COUNTY—		
Bridwell-Continental, W. D. Seay "A" 5, ne ne ne nw 10-7s-5w	172	1101
Rips, Ungerman & Galamba, Penniston 3, ne ne sw 16-7s-5w (pb 775)	25	804
LAFLORE COUNTY—		
LaFlore G. & E., Hardaway 25, ne sw sw nw 10-6n-22e	*	1951
LINCOLN COUNTY—		
Stanolind et al, Eakers 3, sw ne sw 35-15n-2e	432	5128
LOGAN COUNTY—		
Sinclair Prairie, Smith 1, nw sw se 12-17n-1w	606	5100
Incorporated Pet. Prod., Schloop 3, ne se se 32-20n-2w	120	5100
Stanolind & Amerada, Pfeiffer 10, se ne se sw 33-20n-2w	3128	5068
OKMULGEE COUNTY—		
Link Oil, Jefferson 3, ne nw se 35-15n-15e (pb 1784)	¶25	1789
OSAGE COUNTY—		
E. A. Babcock, 1-A, se sw se ne 14-22n-10e	*	1740

Now pools opened in Russell and Chautauqua counties.

* * *

Lost Springs pool is extended half mile southwest.

Wichita.—Two new pools were reported from Russell and Chautauqua counties, and extensions were noted in Rice, Marion, Ellis and McPherson counties.

The new Russell County area was opened by R. H. Shields' Giese 1, SEc NE 28-14s-13w, one mile west of the Letsch pool. Bottomed at 2915 feet in Kansas City lime, the well made 70 barrels of oil before acidization with 5000 gallons. Following the acid treatment it made a potential of 2145 barrels of 39.1 gravity oil.

North of the pool, in the Rogg area, Cities Service Oil Company's Rogg 2, NE SE NE 27-14s-13w, topped Kansas City lime at 2856 feet and following acidization with 6000 gallons at 2940 feet, swabbed 281 barrels of oil in 13 hours. The well was then drilled to 2982 feet and had 1100 feet of fluid in the hole. In 16 hours it pumped 540 barrels of fluid, 16 percent of which was water. It was testing.

Midway between the town of Cedarvale and the Sedan area of Chautauqua County, W. G. Buffington opened a new producing area at Fisher 1, CWL SW 10-34s-9e, producing from sand at 3679 feet. It was estimated good for 25 barrels of oil daily.

Continental Oil Company's Gum 2, SW NW SE 34-19s-10w, extended the east end of Silica pool, Rice County, one location, making a potential of 1116 barrels of oil. Production was from Siliceous lime at 3307 feet, the total depth. After an acid treatment the well pumped 420 barrels of oil in 8 hours.

John Harwood et al's Novak 1, NEc SW 28-17s-4e, extended the Lost Springs pool of Marion County one-half mile southwest last week, showing for a commercial producer from chat .Top of the formation was found at 2420 feet and it drilled to 2484 feet where it filled 400 feet with oil.

The Bemis pool of Ellis County was extended one location southeast by Cities Service Oil Company's Hall 2-B, SW NW NW 26-11s-17w, which filled 2700 feet with oil in 2½ hours. The plug was drilled at 3385 feet in Siliceous lime for the fill-up. The test is an east offset to Deep Rock Oil Corporation's Baumer 2, SE NE NE 27-11s-17w, which was completed for 2938 barrels of oil at 3482 feet in the lime.

Pawnee Rock Extension Likely

Possible extension well for the Pawnee Rock pool of Pawnee County is Mid-Continent Petroleum Corporation's Smith 1, NWc SE 13-20s-16w, one-quarter mile northeast of the pool. The well flowed 13½ barrels of oil in one hour with gas gauged at 36,000,000 cubic feet, coming from 3801 feet in Siliceous lime. Said to be the first Siliceous lime well outside of the Otis gas and oil pool of Rush County to make such a large amount of gas with the oil, the well was to have been allowed to flow for 2 or 3 hours, then drilled deeper. Operators expect the pay within 5 or 6 feet. It started off making 1,500,000 cubic

Company, Well and Location	Init. Prod. Bbls.	Depth
PONTOTOC COUNTY—		
Carter & Gulf, Wells 2, sw sw nw 2-1n-7e	461	4115
Mid-Continent, Statler 9, sw nw sw 2-1n-7e	388	4045
Continental, Epsie Brown 1, ne ne nw 11-1n-7e (pb 4281)	15	4616
H. Turner, Malloy 1, sw ne sw 30-2n-4e	*	478
Blackstock, Daniels 7, se se sw 21-2n-7e	152	2622
Samedan, Bates 1-B, nw se ne 27-2n-7e	149	2625
Magnolia, Burris "B" 1, sw se ne 28-2n-7e (pb 4160)	140	4305
Campbell, Owensby 2, se sw sw 21-3n-4e (pb 975)	*	997
Benedum & Trees, B. Burke 2, nw nw nw 33-5n-5e (otd 2310) (pb 2582)	6	2592
Dixon, Jackson 3, se sw 22-5n-6e (pb 1755)	*	2846
H & M Drlg. Co., Harrell 6, sw ne se 29-5n-8e	40	842
Mary F. & Delaney, Harris 1-A, nw se se 29-5n-8e	*	860
POTTAWATOMIE COUNTY—		
Mudge, W. E. Harber 1, nw nw sw 23-7n-4e (pb 3378)	*	4100
McCreslenn, Tucker 1, se se se 34-7n-4e	39	4283
PUSHMATAHA COUNTY—		
Halliburton et al, Bagwell 1, sw sw ne ne 30-3s-15e	*	6010
SEMINOLE COUNTY—		
W. C. McBride, E. M. Gaines 1, se nw sw 20-6n-7e	¶7	2775
W. Neustadt, Fee 1, se ne sw 25-5n-7e	65	2276
Mid-Continent, Fleet 16, sw se se 7-5n-8e (pb 4180)	224	4220
P. Traugh, Scrogging 4, se nw ne 22-6n-6e	50	2338
Texas, W. Huddleston 1, sw sw se 29-7n-6e (pb 3010)	16	2935
STEPHENS COUNTY—		
Gulf Oil Corp., Sims 14, sw se nw 13-2s-4w	6	442
Magnolia, Blaylock 4, nw sw nw nw 14-2s-5w	3	937
TULSA COUNTY—		
Bauder et al, Johnson 1, cnw ne 8-18n-14e	*	968
Epler et al, McIntosh 1, sw sw nw nw 8-18n-14e	*	968
L. Martin et al, Johnson 1, c ne sw 7-18n-14e	*	1420
Trowbridge & Moore, McIntosh 1, nw sw se 7-18n-14e	¶4	954
Childers 1, nw sw sw 8-18n-14e	¶3	951
Fee 1, sw sw ne 8-18n-14e	¶8	946

*Failures: †Junked; ¶Million cu. ft. gas.

feet of gas and jumped to 28,000,000 cubic feet in a short time.

Mid-Continent Petroleum Corporation's Bixby 1, NWc 24-20s-16w, topped Siliceous lime at 3813 feet and drilled to 3820 feet. Seven-inch casing was run to the top of the lime and it was to have drilled in December 10.

Tom Johnson et al's Shaw 3, NE NW SW 21-19s-1w, extended the Decker area of the Ritz-Canton pool of McPherson County one-quarter mile south last week when it was completed for a potential of 298 barrels of oil.

One-quarter mile southwest of production in the Kraft pool of Barton County, Sinclair Prairie Oil Company's Grossardt 1, NEc SW 10-17s-11w, which had considerable mechanical difficulty two weeks ago, last week made 305 barrels of oil in 24 hours. Acidization, first with 1000 and later with 3000 gallons, stepped up production, which was made on pump. Total depth was 3320 feet in Siliceous lime.

Possible extension one-half mile south for the Otis gas and oil pool of Rush County was in prospect at Moss Petroleum Company's Rodie 1, NEc 27-18s-16w. After topping a sand at 3526 feet, a core with spotted saturation was recovered to 3548 feet.

Ryan Consolidated Oil Company's Bemis 1-C, SEc SW 21-11s-17w, which many believed to be the defining well for the west edge of the Bemis pool of Barton County, has been given a potential of 2734 barrels of oil daily, further enhancing the value of the pool in that direction. Top of the Siliceous lime was at 3402 feet and production was from 3416 feet. Bemis pool is one of the most orderly developments in the state.

Another well, drilled in the same section by Ryan Consolidated Oil Company was looked on as a sure failure, but made a potential of 3092 barrels of oil from 3451 feet in Siliceous lime, which it topped at 3444 feet. This was Bemis 2-C, SW SE SW 21-11s-17w. Moving north, the company drilled Bemis 3-C, NE SE SW 21-11s-17w, which went to 3414 feet in Siliceous lime for a potential of 3073 barrels of oil.

Shell Petroleum Corporation's Rumsey 1, NWc 23-11s-17w, had a saturated core from 3410 to 3413 feet after topping Siliceous lime at 3407 feet.

Helmerich & Payne's Stebbins 1, NWc SE 7-13s-20w, was drilling below 3800 feet late last week after getting a small show of oil from 3655 to 3665 feet. The test is three miles southeast of production in the Gugler pool of Trego County.

Mid-Continent Petroleum Corporation's Schmidt 7, NWc SW 36-19s-11w, in the Barton County portion of the Silica pool, made a 24-hour potential of 385 barrels of oil, producing from 3309 feet in Siliceous lime. Top of the formation was found at 3289 feet. During the first four hours the well made 111 barrels of oil and 64 barrels the following 4-hour period.

The Texas Company's Schmidt 7, SWc NW 36-19s-11w, topped Siliceous lime at 3300 feet and drilled to 3324 feet. After a 60-quart shot, the hole filled 1000 feet with fluid. It then swabbed 12 barrels of oil and 24 barrels of water in two hours and was shut down for orders.

Olson Drilling Company et al's Fowler 1, CSW 26-27s-22w, southeast of Dodge City in Ford County, is shut down at 5855 feet in Siliceous lime, with nothing showing. Top of the lime was 5832 feet. It had Mississippi lime at 5045 feet and a showing of oil at 5060 feet. Both Viola lime and Simpson sand were dry.

Magnolia Petroleum Company's Zink 1, SW NW SW 32-17s-10w, recent extension well for the Habiger pool of Ellsworth County, pumped 166 barrels of oil and 32 barrels of water during a 20-hour test of the Kansas City lime at 3024 feet. The test followed acidization. It extended production one-quarter mile north two weeks ago. It has been classified as a minimum well and given an allowable of 15 barrels of oil daily.

Skelly Oil Company's Volkland B-1, NW SW NW 5-18s-10w, south of the Stumps pool in Rice County, had top of the Kansas City lime at 2923 feet. A core from 2988 to 3004 feet had an almost complete recovery with the oil pay showing between 2993 feet and bottom. Operators were rigging up standard tools.

Kansan Oil Corporation et al's Mease 1, NE SE SE 27-30s-11w, southeast of Idabel in Barber County, was drilling below 4449 feet. Two weeks ago the test had a saturated core from 4442 to 4444 feet in chat. When the plug was drilled it showed free oil.

Swabbing test was scheduled for W. E. Witt et al's Fair 1, NW SE SE 4-22s-8w, which opened a new producing area three miles south of Sterling in Rice County two weeks ago. Conservative estimates state the well should be good for 350 barrels of oil daily. The hole filled 1800 feet with oil in 12 hours after preliminary swabbing tests were completed. Total depth is 3344 feet in conglomerate.

Five Tribes land sale

Muskogee, Okla.—Next sale of restricted allotted Indian lands of the Five Civilized Tribes will be held here December 16, beginning at 10:00 a. m., according to A. M. Landman, superintendent. While 125 tracts were originally scheduled to be offered, 8 more have been added, bringing the total to 133 tracts comprising 11,226.91 acres, one of the largest sales of the year. One coal and asphalt mining lease is offered in Latimer County, and a fee land sale of unallotted land in Atoka County will be offered. The latter tract has a minimum cash price of $140.00.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARBER COUNTY—		
Olson & Skelly, J. C. Elsea 1, sw se nw 27-32s-14w	*	5248
BARTON COUNTY—		
Cities Service, Bitter 4, ne nw nw 5-16s-13w	818	3326
Bitter "B" 1, nw nw se 8-16s-13w	1237	3384
Stanolind, Stueder 2, ne ne sw 26-16s-13w	*	3403
Shell, J. Maier 1, ne ne nw 2-16s-14w	1134	3337
National Ref. Co., McLean 8, sw se se 25-17s-11w	339	3282
A. E. Merrian, Norris 1, ne ne sw 33-17s-11w	*	3354
Stanolind, Schmidt 2, ne ne se 35-19s-11w	406	3316
A. Schartz 4, se ne sw 2-20s-11w	1039	3316
Kowalsky 6, sw nw ne 11-20s-11w	1578	3283
F. Panning 6, se se nw 11-20s-11w	1623	3290
Hagen "A" 1, se se se 21-20s-11w	*	3333
Lario-Atlantic, D. Bryant 2, ne se se 23-20s-11w	1289	3276
CHAUTAUQUA COUNTY—		
C. E. Skiles, Landon-Floyd 2, sw nw se 23-32s-10e	6	2070
Skiles et al, Shaffer 2, nw sw ne 23-32s-10e	10	1967
C. L. Brassius, Garrett 1, nw sw nw 26-32s-11e (pb 1545)	*	2076
Brosius & Neely, Landon-Floyd 1-A, sw nw se 29-32s-11e	*	2343
Ingot O'l, McKee 1, sw ne sw 21-32s-12e	2	1209
W. G. Buffington, Fisher 1, sw sw nw 10-34s-9e	25	1679
Sinclair Prairie, Winans 10, ne sw sw ne 27-34s-11e	*	2130
COFFEY COUNTY—		
Preston & Hart, Kufahl 2, sw se nw 11-23s-13e	10	1812
COWLEY COUNTY—		
Deep Rock, Cranston 2, sw nw ne 30-32s-6e	437	2196
ELLIS COUNTY—		
Cities Service, Johansen 7, ne ne nw 22-11s-17w	1664	3404
Magnolia, Johansen 7, se nw se 22-11s-17w	2561	3402
Phillips, Staab 4, se sw ne 11-12s-18w	2868	3690
ELLSWORTH COUNTY—		
Skelly, Zink 2, se sw sw 32-17s-10w	7421	3016
GREENWOOD COUNTY—		
Molter, Ledgerwood 1, nw se nw 36-27s-8e	9	1857
Eagle Oil Co., Stine 1, ne ne se 13-28s-10e	*	740
HARVEY COUNTY—		
Shaffer et al, Dettweiler 2, nw se ne 2-23s-2w	754	2995
E. J. Shaffer et al, Sanders 1, nw nw sw 20-23s-3w	257	3371
Olson, J. Schrag 6, ne se sw 30-23s-3w	595	3365
McPHERSON COUNTY—		
C. E. Ash, Broman 1, ne ne nw 19-17s-4w	*	3730
Continental, Goering 6, sw sw sw 29-21s-1w	542	3079
NESS COUNTY—		
Oriental O'l Co., Tenny 1, cn½ nw se 19-18s-25w (pb 3280)	1323	4452
RENO COUNTY—		
A. Austin, Schwiethale 1, sw sw ne 17-23s-10w	*	3790
Magnolia, Thorne 3, ne se ne 17-26s-4w	*	4033
RICE COUNTY—		
Hartman & Blair, Schartz 2, sw nw se 33-19s-10w (pb 3333)	*	3351
Stanolind, W. F. Hathaway 7, ne se nw sw 33-19s-10w	1559	3301
Fred Phillips, Oden 1, se ne nw 22-20s-7w	*	3742
Republic, Oden 2, sw nw nw 5-21s-7w (pb 3350)	*	3353
Mid-Plains Pet., L. Hauchield 2, se se sw 11-21s-7w	332	3382
RUSSELL COUNTY—		
Stanolind, Baxter "A" 15, sw ne sw 32-13s-15w	211	3309
Cities Service, Strecker "A" 7, ne sw ne 35-14s-14w	1118	3179
Shaffer, Cramm 3, sw nw se 11-4s-15w	598	3269
Lario et al, Waudby 2, ne ne se 26-14s-15w	*	3195
C. L. Price, Sebesth 1, ne ne ne 36-15s-11w	*	3435
Cities Service, Krug 3, sw se se 24-15s-14w	1687	3323
SEDGWICK COUNTY—		
National Ref., Fee 1, se ne se 36-27s-2e	189	3099
STAFFORD COUNTY—		
Stanolind, Max R. Tiechman 1, se se se 13-22s-13w (pb 3744)	*	3760
Torry-Feaster et al, McConaughay 1, ne se nw 8-24s-13w	*	4155
STEVENS COUNTY—		
Pioneer Pet. Co., H. Williams 1, center sw¼	¶12	2803
SUMNER COUNTY—		
Phillips et al, K. Patton 1, cne ne 20-33s-2e	*	3375
Sinclair Prairie, Herrick 4, ne sw se 15-35s-2e	366	3438
WOODSON COUNTY—		
C. Reeser et al, Weide 1, nw nw se 18-25s-14e	*	1556
Saco, Hassenpflug 2, nw nw ne 35-25s-14e	*	1514

*Failures; †Junked; ¶Million cu. ft. gas.

NEW MEXICO

Monument north trend shows signs of ending

Hobbs, New Mexico. — Production trend to the north of the Monument field shows signs of terminating. Enlargement of the field was due to occur in this direction and along the southwest flank. Failure of Continental Oil Company's State 1-A-7, C NE SE 7-19s-17e, west offset to the northernmost producer, to respond to two nitro shots and acid treatment changes the outlook for a continued sweep northward. It was shot with 180 quarts at 3950-4046 feet, then treated with 3000 gallons of acid. The hole remained dry after a 350-quart shot at 3900-4046 feet. It is bottomed near the water level, but will be deepened. Gulf Oil Corporation's Shipp 1-B, the offset, flowed 188 barrels in 18 hours after using acid at 4040 feet, or 325 feet below sea level. Gas production above and in the oil zone is subnormal in this area.

Emperor Oil Company's Johns 1, C SW NW 24-17s-32e, west outpost for the Maljamar field, encountered sulphur water in drilling to the main lime section near the 4400-foot level, with an elevation of 4049 feet. It will be plugged back for nitro shot in the upper lime, which showed for a small oil well. Ralph A. Shugart et al's Coulthard 1, C NW SW 35-18s-31e, eastern Eddy County wildcat, nine miles southwest of the Maljamar area, was drilling at 3650 feet to try for production in the lime. This test swabs 20 barrels of oil daily from sand passed up at 3440-47 feet.

Skelly Oil Company's Combest 1, NW NW SE 27-23s-36e, north outpost for the Cooper field, Lea County, showed sulphur water with small amount of oil after using acid at 3918 feet, or 510 feet below sea level. It was carried below the regular oil and gas horizon.

The sandy-lime belt in eastern Lea County continues to lead in new drilling, having accounted for all but one of the six locations reported last week. Gulf Oil Corporation's Kyte 2, C SW SE 7-19s-37e, Monument area, was the only project for the lime zone. The Penrose field gained two projects through the starting of operations by Danglade & Clower's Clifton 1, C SW SW 4-22s-37e, and Humble Oil & Refining Company's State 1-H, C SW SW 27-22s-37e. Southern Petroleum Exploration, Inc.'s Downes 1, C SE SW 32-21s-37e, is near the junction of the Penrose and Hardy areas.

NEW MEXICO
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EDDY COUNTY—		
Finley-Cherry et al, Buchley 1, c nw nw 28-26s-31e	*	4080
LEA COUNTY (Eaves)—		
Stanolind, C. Farnsworth 29-B (NW) c sw nw 7-26s-37e	¶34	2960
LEA COUNTY (Eunice)—		
Stanolind, State 1, c se se 2-21s-36e	89	3854
LEA COUNTY (Langlie)—		
Anderson-Prichard, Langlie 3, c se ne 8-25s-37e	225	3479
Carl B. King et al, Stuart 1, nw sw sw 11-25s-37e	450	3409
LEA COUNTY (Mattix)—		
Shell, Black 3, se se sw 21-24s-37e.	300	3565
LEA COUNTY (Monument)—		
Continental et al, Britt 1-B-10, c w½ sw sw 10-20s-37e	500	3921
Sanderson 6-A-14, c se se 14-20s-36e	750	3870
Texas Co., State 6-C, c nw ne 19-20s-37e	800	3860
LEA COUNTY (Penrose)—		
Continental et al, Elliott 2-B-6, c nw se 6-22s-37e	500	3796
Gulf, Stebbins 1-B, c ne ne 5-22s-37e	200	3755

*Failures; †Junked; ¶Million cu. ft. gas.

NORTH TEXAS FIELDS

Major drilling campaign taking shape at K-M-A.

* * *

Archer County deep well flows 25 barrels hour.

Wichita Falls, Texas.—Development of flowing production from west and south extensions for the K-M-A field's deep zone, and favorable showing by a north outpost materially enhances the importance of this Strawn-pay area as a source of high-gravity production. A major drilling program is taking shape, with 23 tests in process of completion and drilling operations underway on 21 additional tests. Field activity is being enlarged as heavy-duty rotary rigs become available. Production extends along an east-to-west trend for 7½ miles, and the prospective north extension gives the west portion of the structure a maximum length of 5½ miles. The field has 64 deep producers.

Production was expanded one mile west by Consolidated Oil Company, Joe Howell et al's W. P. Ferguson 1, located on east line of the W. H. Spillers Survey, A-257. Top of lime was logged at 3649 feet, and first oil saturation at 3706-18 feet. Hole began filling with oil from sandy-lime at 3721 feet, and flowed by heads at 3730 feet. The well flowed 40 barrels per hour at 3734 feet. This output was rated at 50 barrels hourly after drilling in with machine to 3752 feet. It is one mile west of Jack Kadane et al's Mangold 1, which flowed 2086 barrels of 44 gravity oil in 12 hours.

Archer County began sharing in the K-M-A deep production when E. C. Norwood et al's W. P. Ferguson 1, NEc lot 4, F. Peterswick Survey, A-343, 6800 feet south by west of LeBus et al's Lewis 1, flowed 25 barrels hourly by heads from main pay at 3852-63 feet. Top of lime was called at 3727 feet, and first saturation was cored at 3811 feet.

Christie-Hickman Drilling Company's Bolding 1, north offset to LeBus et al's Lewis 1, near southwest edge of K-M-A field, Wichita County, flowed 340 barrels natural in 12 hours from sandy-lime at 3665-82 feet. Top of lime was logged at 3592 feet, making it the highest structurally for the field. Production is from a section of the Strawn that was cased off by the offset.

Lease prices on acreage lying west of the two extension producers on the Ferguson land advanced to high levels before either test reached the Strawn zone. Fain-McGaha Oil Corporation paid $400 per acre, half cash, for lease on 250 acres out of the H. S. Griffin and J. B. Tidwell tracts, lot 2, W. H. Spillers Survey, A-257. This purchase gives the company an almost solid block of 624 acres. The company had previously sold lease on 125 acres, involving 3 tracts, in the Robert McKim and F. Peterswick Surveys, to Sam K. Vierson et al for $500 per acre.

King Oil Company's J. L. & T. J. Waggoner-Gulf 1, lot 8, M. A. Willis Survey, A-548, is in line to become the fifth producer lying north of the Big Wichita River, and 7000 feet northeast of the nearest producer. This north outpost for the west portion of the field is changing to cable tools to complete after cementing 6⅝-inch pipe at 3760 feet. Top of lime was called at 3652 feet, and first saturation at 3662-72 feet, followed by 12 feet of shale. Oil sand with 3 thin shale breaks was logged at 3761-84 feet. Gulf Oil Corporation farmed out the deep rights on the above tract for an over-riding royalty, ranging from 1/16 to 3/32 interest. It is northeast of Melat & Graham (was E. J. Stump's) Waggoner Bros. 1, W. R. Eaves Survey, A-753, which was drilled to 4041 feet, or 3026 feet sub-sea, and pumped 38 barrels oil in 2 hours then flowed 106 barrels in 24 hours.

Humble Oil & Refining Company is the first major to participate in the development of the K-M-A deep zone, having made location for J. R. Pace 1, SWc of 43-acre lease, R. J. Scott Survey, A-255. It is a north offset to Staley Oil Company's First National Company 1, rated at 900 barrels initial after 480-quart nitro shot in broken sandy-lime at 3817-77 feet. Top of lime was logged at 3690 feet. W. H. Peckham et al's Munger 1, near northeast corner of block 31, KWVFL Survey, broadened the productive limits of the

southeast portion of the field with an estimated potential of 700 barrels. It was shot with 510 quarts of nitro in broken sandy-lime at 3742-3867 feet. The lime marker was logged at 3698 feet.

NORTH TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
Bridwell-Gohlke, Wilson 1-C, lot 11	*	1628
Duncan et al, Andrews 12, blk 18..	*	990
Huggins et al, Perkins 1-C, blk 15	*	1792
Hutcheson et al, Wilson 1-E, sec 112	*	1565
Rathke Oil Co., Hayter 2-C, sec 1598	*	1429
Westmount Oil Co., T. J. Dempsey 1-A, blk 10	*	1825
BAYLOR COUNTY—		
Hampton et al, Cockrell 1, sec 2404	*	750
CLAY COUNTY—		
Bridwell Oil Co., Edrington 1-A, blk 24	18	1115
Jack Harris et al, Landrum 1, sec 5	*	320
COOKE COUNTY—		
Fain-McGaha Oil Corp., J. W. Mount 4	*	1770
Kingery Bros., Trubenback 5.....	10	924
Trumter Oil Co., Andress 15.....	78	810
Andress 9-A	35	785
Will Sicking 1, blk 15.....	*	115
DENTON COUNTY—		
Rea et al (was Scroggins et al), S. M. Freeman 1	*	2185
Sistrunk & Southward, J. P. Knox 1	*	969
GRAYSON COUNTY—		
Denver P. & R. Co., Cannon 1....	*	5009
JACK COUNTY—		
Big Six Oil Co., L. W. Fields 1..	*	3500
Brazos River Gas Co., P. B. Keyser 5-B	*	3112
Bryson O&G Co., S. M. Jones 1...	*	3320
Buttram Pet. Co., C. K. Cullers 6	20	2039
Hammon & Herbert, F. H. Rhodes 12	526	2995
Mullendore, Berry & Berry, R. R. Clayton 5-B	402	3078
R. R. Clayton 8-B	372	3145
MONTAGUE COUNTY—		
Gulf, W. W. Jones 10-B.....	¶¼	700
Sinclair Prairie, J. W. Uselton 1, blk 65	*	1846
THROCKMORTON COUNTY—		
H. B. Baker et al, Dickey Bros. 1, sec 684	*	372
WICHITA COUNTY—		
Deep Oil Dev. Co., Munger Farm Co. 2-E, blk 25	654	3837
Munger Farm Co. 1-G, blk 30....	812	3881
Grace & Woods, W. L. Hodges 1..	550	3909
Houston et al, Lamb 6.....	*	210
King Oil Co., Mitchell 1, lot 25....	650	3942
LeBus Bros. et al, J. F. Miller 1..	350	3860
Mogren & Anderson, K. T. Goetze 3, sec 2	158	1530
Patterson & Kemp, B. C. Ellis 1..	*	1652
Perkins-Cullum Oil Co., S. B. Burnett 10-A, sec 1	10	1531
Petroleum Prod. Co., First Natl Co. 81, blk 27	624	3855
Reed, Glass & Crenshaw, First Nat'l Co. 12-B, blk 26	601	3846
Ryan Consol'd Pet. Corp., G. E. Nance 126	8	490
Tide Water Associated, W. H. Chilson 10, blk 3.....	18	637
YOUNG COUNTY—		
R. D. Compton Oil Co., J. E. Whitley 1	*	550
S. D. Glover et al, H. Hennig 2, sec 410	8	1090
Howard Pet. Co., G. P. Stewart 11, blk 2	4	550
G. P. Stewart 12, blk 2.....	*	682
King Oil Co., Texas Land & Mtg. Co. 2, sec 207.....	8	748
W. J. Rhodes et al, A. Burkett 6, sec 3412	*	2737
R. E. Skinner et al, J. M. Davidson 2, sec 272	*	2432
Texas Co., N. Finch 12-A, sec 38..	*	850
West & Honea, G. P. Stewart 12, sec 1492	*	925
Wootten & Wilson, S. L. Scott 7, sec 345	¶1½	238

*Failures; †Junked; ¶Million cu. ft. gas.

WEST TEXAS FIELDS

Interval between Wasson east flank producers narrowed.

* * *

Two tests will try for Seminole production extension.

Midland.—The interval between producing wells along the east flank of the Wasson structure, centering upon the Gaines-Yoakum County line, was shortened the past week. American Liberty Oil Company's C. A. Thomas 1, near NWc of south 340 acres of Section 864, Block G, Yoakum County, failed to lower the oil level below 1500 feet on a bailing test after coring lime, showing porosity, at 4949-5030 feet. It is about 1¾ miles southeast of flowing production, and is expected to flow natural when equipped with tubing. Thomas 1 is bottomed at 1438 feet below sea level.

Shell Petroleum Corporation's Geo. Baumgart 1, near SWc Section 828, about 1¼ miles northeast of the above producer, resumed drilling below casing seat at 4875 feet after being idle on account of title work. It occupies a low structural position, having topped the Yates sand at 3020 feet, and first solid lime at 4470 feet, with an elevation of 3587 feet. The Yoakum County portion of the Wasson area is receiving the most field work, due to lease and offset production requirements. The Texas Company has started work on N. W. Willard 1, C SW SW Section 799, and Willard 2, C NW NW Section 799, while Sun Oil Company has made location for J. H. Lynn 1, a west offset to the latter.

Failure for Carter

Amon G. Carter et al's Brand 2, NEc S½ Section 54, Block AX, one-mile plus a location west of the Wasson discovery in Gaines County, eliminated considerable potential acreage in making a failure at 5014 feet or 1438 feet sub-sea. Only a trace of oil was evident with 1700 feet of sulphur water following acid treatment at 4995 feet. Shell Petroleum Corporation's R. A. Cox 1, NEc Section 380, south edge test, failed to exclude water in plugging back from 4995 feet, or 1458 feet below sea level, to 4970 feet, and may be abandoned also. Swabbing tests at 4995 feet averaged 95 percent sulphur water.

Mitchell & Sullivan's T. S. Riley-Shell 1, C NE NE Section 447, Block G, western Gaines County wildcat, fulfilled depth contract in drilling to 5302 feet, and plugging orders followed. Continental Oil Company's E. H. Jones 2, C SE NE of PSL Section 1, Block A-8, wildcat along the same trend, is near a decisive level in drilling at 4980 feet, with an elevation of 3632 feet. It is carrying salt water from lime at 4906 feet.

A one mile east extension for the Seminole pool, Gaines County, is the goal of two tests being started by Amerada Petroleum Corporation. The outpost will be J. B. Robertson 1, C SW SW of W. T. Ry. Section 196, Block G. Equipment is on the ground to drill T. S. Riley 1, C SE SE Section 229, north offset to the discovery producer. This 4-well pool is isolated from rail and pipe line facilities, and production is marketed by tank trucks.

Oil Well Drilling Company's W. E. Connell 1, NE NE SW of PSL Section 28, Block B-16, Ector County, provided 1¾ mile west extension for the Judkins area, in developing 1000 feet of oil in hole from sandy-lime at 3442-45 feet, where operations were halted by a fishing job. This outpost has not reached the main lime section, and if completed as a producer will give the field its greatest width. Rushwold Oil Company's W. E. Connell-Conoco 1-B, NEc of PSL Section 10, Block 16,

WEST CENTRAL TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BROWN COUNTY—		
J. E. Farrell et al, Nichols 1.....	*	2551
COLEMAN COUNTY—		
Anderson Drlg. Co., Vance 1.....	*	1400
Anzac Oil Corp. et al, Morris 3...	*	2345
J. E. Ellis et al, Hallford-Spivey 1	*	1245
McDonald & Campbell, Nelson 1...	*	1481
CALLAHAN COUNTY—		
Consolidated Roy. Co., Kelton 1....	*	735
Dunn & Adair, Pittman 1.....	*	1945
Kamon & Stebinger, Kennard 1...	*	2602
M. J. Murry et al, Ross 3.....	*	1263
Ungren & Frazier, Price 1.....	*	1292
EASTLAND COUNTY—		
Hickok P&D Co., Van Parmer 1..1041		4025
ERATH COUNTY—		
Hoffman-Page Co., Clayton 1.....	*	3232
PALO PINTO COUNTY—		
Lone Star Gas Co., Hart 1.....	*	4157
SHACKELFORD COUNTY—		
G. Bailey et al, Andrews 2.....	*	570
Butler & Horne, Morris-Buie 17...	15	1608
Canyon O&G Co., Underwood 1...	*	781
Duff & Rollins, Dodson 1.....	*	782
Hickok P.&D. Co.-Harry Reynolds, Baker 1	*	1925
Joan Oil Co. et al, Morris-Buie 5..	10	1605
Jones & Stasney, (was Crawford et al), Morris-Buie 5	5	1562
A. V. Jones et al, Newell 1.....	*	1492
S. B. Roberts Co., Davis 4.....	*	1580
Roeser-Pendleton, Inc.-Conoco, Cook 28-A, sec 85	*	3186
Roeser-Pendleton, Dawson 43.....	173	1618
Dawson 44	39	1620
Tannehill et al, Matthews 37.....	*	916
STEPHENS COUNTY—		
Barnett Pet. Corp.-C. F. Greenwood, A. W. Corbett 1	82	4001
Clark-Cowden Drl. Corp.-Russ Pet. Co., Echols 2	†	4017
W. B. Hamilton et al, Grant 1....	*	2918

*Failures; †Junked; ¶Million cu. ft. gas.

paved the way for additional drilling on the west edge of the field with an initial flow of 472 barrels of oil following 400-quart shot at 3410-3650 feet.

Ordovician Failure

An Ordovician failure for western Crockett County was apparent last mid-week when Moore Bros. Corporation's Paul Perner 1, C NW of I&GN Ry Section 37, Block 2, fulfilled contract depth and suspended work at 8008 feet. Nearby lease owners who contributed to this project are being canvassed to determine if they will assist in deepening to the Ellenberger zone, original goal.

Gulf Oil Corporation's Waddell et al 6, west offset to the largest Ordovician producer in the Sand Hills field, Crane County, proved dry when plugged back from flowing sulphur water in Ellenberger lime at 6126 feet to 6092 feet. Top of Ellenberger was logged at 6071 feet, or 3522 feet sub-sea, placing it about 111 feet lower structurally than the producer situated a half mile to the east. Loffland Bros. Company's Reidland 1, SEc of PSL Section 2, Block B-27, easternmost Ordovician test for the area, was drilling at 5440 feet, having failed to make a producer in the Permian section. Gulf Oil Corporation's McKnight 3, Ordivician project, for a separate structure about 4 miles north of Reidland 1, was drilling at 5545 feet.

Mitchell County Leasing

Ordovician prospects based upon geophysical surveys and sub-surface geology have resulted in majors carrying on a quiet lease buying campaign in Mitchell County, oldest oil area in the Permian basin. This activity was preceded by large purchases of long term leases in Scurry County. Standard Oil Company of Texas, owner of the original Mitchell County producing leasehold, has assembled a 1500-acre wildcat block, paying $5 to $11 per acre cash bonus, and is obligated to start a Permian lime project in N½ of T&P Ry. Section 44, Block 29, T-1-N, prior to January 1.

WEST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY (Means)—		
M. J. Delaney Co., H. A. Moore-Gulf 1	*	4579
Humble, J. S. Means 32	252	4548
R. M. Means 14	762	4562
R. M. Means 15	†	3285
ANDREWS COUNTY (Wildcat)—		
Gulf, University 1-G	*	4518
COCHRAN COUNTY (Duggan)—		
Devonian, T. B. Duggan 1	251	5044
ECTOR COUNTY (Foster)—		
Sinclair Prairie, D. A. Johnson 2	413	4249
Sunray-York & Harper, Foster 5	604	4171
T. P. Coal & Oil Co., Foster 1-D	485	4188
York-Harper, Inc.-Sloan-Zook Co., J. E. Bagley 2	247	4377
ECTOR COUNTY (Goldsmith)—		
Atlantic, Cummins 1-F	528	4284
Gulf, Goldsmith 50	2089	4205
Goldsmith 52	400	4245
Goldsmith 55	396	4240
Landreth, Scharbauer 2-L	1072	4210
Magnolia, J. D. Slator 1	1383	4280
ECTOR COUNTY (Harper)—		
Broderick & Calvert, E. F. Cowden 3-C	1325	4286
Honolulu-W. A. Black, Cowden 2-A	822	4321
L. H. Wentz, et al, T. P. Land Trust 1-A	915	4200
FISHER COUNTY (Rotan)—		
Lewis Prod. Co., W. L. Morrow 4	†	2531
FISHER COUNTY (Wildcat)—		
I. J. Allen et al, H. S. Newman 1	*	3446
Consolidated-N. H. Martin, K. Florida 1	*	3607
GAINES COUNTY (Wasson)—		
A. G. Carter et al, Langdon 1-A	775	4980
GLASSCOCK COUNTY—		
Amerada, Neal 1	*	3370
HOWARD COUNTY—		
Iron Mountain Oil Co., Snyder 2	1248	2800
JONES COUNTY—		
R. S. Allred & R. W. Gray, Jackson 2	395	2001
Brown Eagle Oil Co.-S. B. Roberts Co., Guitar 5	463	2001
Fain-McGaha-S. B. Roberts Co., Daugherty 1	600	1957
Guitar Trust Est. Fee 10	200	2004
S. C. Herring et al, H. C. Jackson 3	200	2003
W. L. & S. C. Herring et al, J. W. Grogan 1	*	2708
Thos. D. Humphrey et al, Guitar 4	125	2017
Iron Mountain-Humble, Jones-Stasney 2	7200	3244
John Kraker et al, J. C. Shankles 1	30	2002
Lewis Prod. Co., J. W. Wooters 1	*	2050
Tom B. Medders & Hedrick, Shaheen 1	*	1963
Sinclair Prairie, B. King-Dorsey 12-B	181	2167
R. G. Trippett et al, Guitar 12	119	2015
E. A. Ungren & A. J. Frazier, H. Dorsey 5-A	229	1977
Ungren-Frazier & Jones-Stasney, Ekdahl 1	*	3306
Yingling et al, Thane 1	*	3301
MARTIN COUNTY—		
Greene, Conkling et al, Holt 1	*	4753
PECOS COUNTY (Torborg)—		
Cardinal Oil Co., Smith 20-A	17	403
Stanolind-Continental, Tippett 14-C	4	487
Tippett 15-C	11	487
STERLING COUNTY—		
Wilcox O&G Co., Kinnebrew 1	*	4100
UPTON COUNTY (McCamey)—		
Basin Oil Properties, Baker-Gulf 7-B	1147	2360
Cardinal Oil Co., Wooley 6	622	2161
Humble, Ricker 6-B	65	2645
Ricker 7-B	575	2379
Robinson & Coleman (was Cook et al), T. A. Kincaid 1	*	3002
Stanolind, A. S. Burleson 48	120	2025
WARD COUNTY—		
Magnolia, Sealy 1, sec 79	*	4316
T. P. Coal & Oil Co., James 22	304	2524
WINKLER COUNTY (Henderson)—		
Humble, Walton 18-C	875	3065
Stanolind-Westbrook-Thompson Hold. Corp., Hendrick 2	1183	3082
WINKLER COUNTY (Kermit)—		
Humble, Colby 10-B	151	3040
Colby 23-C	744	3075
Magnolia, Walton 98	909	2940
Walton 109	406	3228
Walton 115	984	2940

*Failures; †Junked; ¶Million cu. ft. gas.

TEXAS PANHANDLE Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
E. W. Means et al, E. Cooper 1-C	576	3125
Stanolind, L. C. McConnell 5	156	3258
Texas Co., Boney-Magnolia 8	420	3144
GRAY COUNTY—		
Cities Service, Cunningham 12	598	3323
Shell, Combs 3	379	3097
T. B. Haggard 8	733	3301
Sinclair Prairie, P. A. Coomley 6	739	3211
Stanolind et al, A. Waggoner 9	329	3314
HUTCHINSON COUNTY—		
Holmes et al, J. K. Quinn 7	700	3100
Phillips, W. B. Haile 5	298	3100
Jordan 6	361	3026
J. J. Perkins 14	458	3023
Stanolind, W. B. Haile 9-A	390	3074
W. B. Haile 8-B	280	3059
H. C. Pitcher 10-A	538	3144
H. C. Pitcher 11-A	429	3166
R. C. Ware 9-A	410	3152
R. C. Ware 10-A	384	3150
R. C. Ware 11-A	458	3173
R. C. Ware 12-A	458	3201
R. C. Ware 13-B	444	3175
Texas Co., W. E. Herring 1-B	181	3235
MOORE COUNTY—		
Phillips, Standhope 1	¶37.3	3101
Shell-Sinclair Prairie, Wilson 1	¶63	3109
Texoma Nat'l Gas Co., H. F. Johnson 1	68.7	3010

*Failures; †Junked; ¶Million cu. ft. gas.

Prospecting on Opelika structure is suspended

Tyler, Texas. — Prospecting on the Opelika structure, Henderson County, has been suspended as result of removal of the rig used in completing a gas and distillate producer from the lower Glen Rose section of the Trinity. Tide Water Associated Oil Company et al's McElreath-Suggett 2-C produced 13½ barrels of distillate per hour, with gas volume rated at 8,898,000 feet daily through half-inch choke, after plugging back to pay at 7910-50 feet. The well registers 3200 pounds closed in pressure on tubing and 3300 pounds on casing. No market is available for the gas, thereby preventing owners from realizing on the distillate yield.

Humble Oil & Refining Company and Gulf Oil Corporation's Robertson 1, Gregg County Trinity test for the east flank of the East Texas field, was coring red beds and shale at 7540 feet.

Humble Oil & Refining Company's Southern Pine 1-C, near Jarvis, Anderson County, was coring shale and lime

Texas pumping wells increase 6000 in year

Reports released by the Texas Railroad Commission last week show that the total production of oil in Texas for the month of October was 44,426,465 barrels, an average of 1,430,000 barrels per day.

This was some 40,000 barrels daily less than the September production, which averaged 1,470,874 barrels.

There were 76,095 producing wells listed, which include 30,455 flowing wells and 45,640 pumping wells. This was a total gain of 752 new producing wells during the month. Pumping wells increased 6169 during the year.

Receipts by pipe line companies during October totaled 44,032,692 barrels. There were 45,235 barrels of oil shipped in tank cars, 137,417 barrels moved by truck, 33,108 barrels were used for fuel, and 23,962 barrels of crude were disposed of for miscellaneous purposes.

Despite the fact that the number of wells was larger, the average allowance per well, 19.4 barrels, was exactly one barrel higher than it was for the same month last year. Comparative figures for the two years are listed in the table below:

Item—	October 1936	October 1937
Number of Operators	4,611	5,094
Number of Leases	13,367	14,915
Flowing Wells	26,765	30,455
Pumping Wells	39,471	45,640
Total Wells Producing	66,236	76,095
Lease Storage (Beginning)	4,194,703	4,531,703
Total Allowable	37,717,038	45,866,447
Daily Average Allowable	1,216,678	1,479,563
Daily Average Allowable Per Well	18.4	19.4
Reported Production	36,856,571	44,317,770
Daily Average Production	1,188,922	1,429,605
Daily Average Production Per Well	18.0	18.8
Runs to Pipe Lines	36,605,944	43,898,331
Tank Car Movements	37,766	45,235
Truck Movements	134,265	137,417
Used as Fuel	33,753	33,108
Miscellaneous Uses	30,258	23,962

at 8810 feet. Stanolind Oil & Gas Company and Ramsey Petroleum Corporation's Norris 1, located on Thornton fault, Limestone County, was drilling hard sand member of the Travis Peak at 6880 feet, and is slated to proceed to the Lower Marine.

EAST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Atlantic, Kinney 47 (335.28-ac)	3000	3624
DeArman & Ford, J. D. Rettig 7	*	3717
C. A. Everts Drl. Co., F. Cole 9 (49.67-ac)	5400	3763
R. Haddaway et al, M. E. Church 6 (2-ac)	7700	3765
Haynes Oil Corp., C. Lee 20 (73.6-ac)	5600	3650
Humble, Kangerga 67-A (333¼-ac)	4800	3660
Kangerga 16-B (124.6-ac)	5000	3637
Ohio, H. Clay 24 (113.56-ac)	1000	3671
Rusk Crude Oil Co.-McDonald-Campbell, Wheelis 5 (5-ac)	7000	3780
Sinclair Prairie, McCord 7 (50-ac)	1500	3645
Sun, Hendon 21 (119.41-ac)	144	3609
Texas Trading Co., Deason 4 (6-ac)	1200	3733
Joe Zeppa et al, J. Minchew 5 (21-ac)	3600	3765
KILGORE AREA—		
Hugo Allen et al, Bean 2 (1.7-ac)	5000	3618
Arcadia Ref. Co., Jeffrey 8 (30.2-ac)	480	3761
Barnett Pet. Corp., I&GN 5 (3.9-ac)	7000	3642
Beard et al, Muckelroy 8 (19-ac)	4600	3603
Beren et al, Brittan 3 (30-ac)	96	3602
Callender et al, Rowland 8 (8.84-ac)	160	3536
Rowland 9 (8.84-ac)	120	3529
Cal-Tex Corp., Crim 11 (50.65-ac)	6000	3583
Devonian-Gulf, Motley 41 (442.1-ac)	6800	3688
Gillum, Florey & Warren, I. Brightwell 1-a (7½-ac)	2500	3618
Glasscock et al, Duncan 9-B (40-ac)	4200	3575
Gulf, Watson 19 (92.97-ac)	8500	3596
Hamill & Smith, J. M. Dickson 1	3000	3580
Humble, J. E. Sexton 11-A (68.8-ac)	8200	3727
T. L. James & Co., L. Lacy 13 (21½-ac)	5600	3561
L. Lacy 16 (21½-ac)	4500	3565
T. A. Johnston & Owens, M. T. Cole 12-B (33.7-ac)	8800	3513
Jones & Jones, M. J. McNeeley 1 (½-ac)	500	3590
Magnolia, W. B. Goyne 6 (31.71-ac)	7400	3620
McVey et al, Dickson 3, blk 137	1500	3532
Midfield Oil Co., Mitchell 2 (2.6-ac)	5200	3615
Miller et al, B. Laird 2-B (2-ac)	300	3581
Navarro Oil Co., Brightwell 26 (110.7-ac)	6400	3616
Green 9 (23.27-ac)	750	3578
Chas. Pettit et al, Utzman 3 (1.9-ac)	1200	3534
Potter et al, Compton 1, blk 120	2000	3555
Potter Bros. et al, Crane 2, blk 139	1500	3550
Geo. Prendergast et al, Dick Beall 7 (11.9-ac)	7000	3555
Sharp et al, King 3 (2-ac)	3000	3534
Stanolind-Tide Water, Walker 5-B (51-ac)	4600	3561
Sun, Hilburn-Loyd 34 (133.7-ac)	4200	3632
S. K. Vierson-Kingwood Oil Co., Muckelroy 11 (30-ac)	8500	3545
J. D. Wrather-Westline Oil Co., Morris 6 (34.6-ac)	1500	3643
LONGVIEW AREA—		
Allen et al, Hall 1-B (52/100-ac)	3600	3618
Atlantic, Burnside 38-B (217.16-ac)	9300	3588
Jas. Wilson 18 (100-ac)	9000	3642
Clarkson et al, O'Byrne 7 (46.2-ac)	1200	3667
FHE Oil Co., B. C. Christian 23 (87-ac)	8700	3650
FHE & Fleming-Kimbell Corp., Flemister 13 (45-ac)	9500	3655
Gen'l American Oil Co., Sheppard 14 (57.45-ac)	6200	3702
Gilcrease Oil Co., Tooke 4-A (23.1-ac)	10,000	3555
Humble, Edwards 36 (271.6-ac)	3500	3668
McFarland 12 (66⅔-ac)	7200	3688
Johnston-Dean Bros., Miller 1 (80-ac)	*	3790
Magnolia, Davis 14 (66.42-ac)	8800	3581
Brawley 19 (80-ac)	9000	3500
Peyton Bros. et al, C. Jones 3 (2½-ac)	8400	3590
Shell, Richey 30 (169.4-ac)	9000	3590
Sinclair Prairie, Lawson 20 (84.19-ac)	9200	3520
Stanolind-Falcon, Everett 1-A (70-ac)	200	3667
Everett 4-B (62.1-ac)	1000	3621
Williams 13-B (71-ac)	750	3703
Sun, A. B. Mackey 5 (44.76-ac)	1000	3689
Superior, Ingram 24 (164-ac)	10,000	3595
Tide Water Associated, Davis 23 (133.8-ac)	10,500	3551
Nettleton 10-B (148¾-ac)	6400	3492
Trico Oil Co., Free 3 (3.3-ac)	2000	3647
Wilson et al (was Nathan Oil Co.), Walker 17 (40-ac)	1500	3567
ANDERSON COUNTY (Long Lake)—		
Hunt Oil Co., Tucker 1-B	¶115	5398
FRANKLIN COUNTY (Talco)—		
L. S. Flannery, Hedrick 9 (65-ac)	549	4306
Humble, King 49 (1053.36-ac)	153	4309
Wims 1-B (79-ac)	165	4299
TITUS COUNTY (Talco)—		
Humble, Galt 7 (70-ac)	309	4285
Graf 2 (74.15-ac)	234	4315
King 30 (1053.36-ac)	135	4307
McPeters 2 (78.26-ac)	121	4308
Lucey Pet. Co., Williams 10 (319.85-ac)	411	4286
VAN ZANDT COUNTY (Van)—		
Pure, McMahon 3 (48-ac)	15	2928
FRANKLIN COUNTY—		
Stroube & Stroube, Banks 1	*	4361
HOPKINS COUNTY—		
Abbott & Rutland, Peyton 1	*	4502
CASS COUNTY (Rodessa)—		
Bay Oil Corp., Cobb 4, G. Crowder sur	151	6091
Union Producing Co., Hall 4, J. N. Jackson sur	264	6087

*Failures; †Junked; ¶Million cu. ft. gas.

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Ar. Dallas	8:45 PM	Ar. Houston	9:00 PM

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SOUTHWEST TEXAS

Deep Frio sand producing trend extended 25 miles.

* * *

Completing Keeran-Placedo connecting well in Frio.

* * *

Victoria County promises to be hot spot during 1938.

Corpus Christi.—South Texas deep Frio sand producing trend was expanded another 25 miles to the southwest through the completion of a large crude producer by the Magnolia Petroleum Company et al on the A. A. Seeligson ranch, one mile out of the southeast corner of Jim Wells County.

The well was drilled to 8165 feet, 7-inch casing set at 6779 feet, the hole plugged back and perforated at 6585-95 feet with seven shots, following which the well flowed 204 barrels of 36.5 gravity oil in 13 hours through 7/64-inch choke on one wing and 9/64-inch choke on the other wing of the Christmas tree. The pressures were 2000 pounds on tubing and 1250 pounds on casing. It is reported to have flowed 195 barrels in 24 hours through 7/64-inch tubing with the pressures being the same on another test.

Called "East Premont"

This test is in the Los Jaboncillos Survey, five miles east of the Premont field, also opened by the Magnolia Petroleum Company et al, and is on the same 10,443.7-acre lease. The new area will be known as the East Premont field. Magnolia Petroleum Company holds one-half interest, Transwestern Oil Company, one-fourth interest, and Sinclair-Prairie Oil & Gas Company, one-fourth interest.

Produces Crude

This discovery is looked upon as being very important in that it produces crude rather than distillate, as has been the case in the majority of the wells in this portion of the South Texas coastal trend. Likewise, it is producing below a series of high pressure gas and distillate sands encountered in the Frio. In fact, the well blew out, ran wild and burned after it had been cored to 6508 feet, apparently in the upper sector of the present producing sand. It is believed to be producing from a sand lens on the flank of a big structure, the apex being to the northwest.

Completing Connecting Well

To balance this strike is an important well on the east side of the South Texas Coast district. Stanolind Oil & Gas Company was finishing Henderson and Pickering 1, which is opening a new producing horizon in the Frio and at the same time is connecting production in the Keeran and Placedo fields, Victoria County. After drilling to 7502 feet, the test was plugged back and casing perforated at 6372-75 feet. On a drill stem test through ¼- and ⅜-inch chokes, the well built up a pressure of 60 pounds and flowed pipe line oil in 19 minutes. Two minutes later, the pressure built up to 300 pounds and the tool closed. It was being completed as the week closed.

Second Heterostegina Producer

Barnsdall Oil Company's J. A. McFaddin 1 is being completed as the second Heterostegina (Greta) sand producer in the McFaddin field, also Victoria County. Located 1760 feet south of the first producer, it looks like an even larger well. It found a gas sand at 4359-78 feet, the last two feet carrying four percent saturation. Sandy section was found to 4404 feet, and good oil sand to 4412½ feet. A drill stem test at 4404-12½ feet was made through ¼- and ⅜-inch chokes, using 850-foot water cushion. At the end of 44 minutes, it flowed pipe line oil and built up 60 pounds working pressure. Tool was closed at the end of 49 minutes and casing landed on bottom. It is being completed through perforations.

Victoria County to Front

Victoria County rapidly is becoming the most important area along the South Texas Gulf Coast and it is likely that it will be the center of a most active program during 1938. McFaddin, North McFaddin, Placedo, Heyser, Keeran and Bloomington, all on the same general strike, will be virtually tied into the largest single producing area in this portion of the Gulf Coast.

George H. Echols has made a deal to drill two wells on the Bloomington prospect, about 2½ miles northwest of the Heyser field and in the A. Perez Survey. One will be on the W. H. Dunseth tract, while the other will be on the C.E. & R.I. Stubblefield tract, each testing the Frio. This may further connect the various producing areas along this trend.

Gulf Extends Heyser

Gulf Oil Corporation extended Heyser field, 3600 feet nearer to the Placedo area through the completion of R. L. Bonner 1, Tract 4, which flowed at the rate of six barrels of oil per hour through ⅛-inch choke under pressures of 1500 pounds on tubing and 1600 pounds on casing. It topped gas sand at 5468 feet, oil sand at 5476 feet and is bottomed at 5487 feet.

Over in the extreme eastern portion of Victoria County, five miles southeast of Telferner, W. V. Bowles and Company's Robertson 1 developed a large amount of salt water with considerable oil on drill stem tests between 5610-29 feet. The test again has been plugged back to 5000 feet and will sidetrack again and try recoring the possible sands.

Wildcat to Perforate

Nueces County had one interesting well, Southern Minerals Corporation's Richard King 3, which found sand showing gas 3989-4012 feet and oil sand 4012-15 feet, setting casing on bottom for completion via perforation. The well is ¾ mile southwest of King 2, an oil producer, and is one of a series of wells to be drilled by this company in an effort to develop oil production on the flank of the Bentonville-King structure.

Frio sand wildcat trying to open field at La Reforma

Mission.—J. L. Collins & Company's A. Guerra 1, San Jose Grant, is still attempting to open a field on the La Reforma prospect in Starr County, where it encountered a Frio sand at 6125-43 feet showing oil. The well was tested through perforations reported to have been made at 6125-27 feet, following which it flowed salt water with a small amount of 29.9 gravity crude and built up 30 pounds pressure on casing. It is believed that this measurement is in error and the perforations actually were somewhere below 6130 feet. A new set of perforations were made at 6125-27 feet after the first were squeezed off.

Abandoned Well Blows Out

Moss and Heard's Ricaby 6, in Porcion 83, 2 miles southwest of South Ricaby and one mile east of the Rio Grande City area, Starr County, blew out at 1765 feet after having been standing temporarily abandoned for a number of weeks. Derrick and rig were pulled down to safety.

Atlantic Refining Company's American Rio Grande Land and Irrigation Company 1, Hidalgo County wildcat two miles southwest of Weslaco, was making hole near 9000 feet, having passed through a gas and distillate sand at 8791-8818 feet, one of several found below the casing set at 8505 feet.

Standard Oil Company of Texas apparently was opening a new sand lens in the Alta Mesa field with a ¼ mile southwest extension to that Brooks County area. Mestina 10, Lease 1, plugged back from 3100 feet and perforated liner at 2597-2613 feet with 13 shots.

Completion of Vicksburg trend opener is delayed

Beeville.—Salt water, possibly due to a bad cement job, delayed completion of Rual B. Swiger et al's Carrie Wood 1-B, on the Sarco Creek prospect in southern Goliad County. The well was drilled to 5048 feet, casing perforated at 5008-19 feet and 5022-23 feet, following which it swabbed salt water. The bottom foot was squeezed off and the well swabbed. Standing over night, the test filled 835 feet with fluid and built up 190 pounds casing pressure. The first 535 feet was pipe line oil, about 27 gravity, the remainder about half oil and half salt water. The swab was run again and the fluid rose 1500 feet in 10 minutes, being all salt water. The hole then

was plugged back to 5000 feet and cement was scheduled to be drilled out and perforations made at 5008-12 feet for new completion attempt.

Live Oak County, with 13 wildcats, is the most active area in the Pettus district. Two abandonments were reported. Bee County has two wildcat locations to be started shortly.

SOUTH TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
SAN ANTONIO DISTRICT		
CALDWELL COUNTY—		
Crouch, Davis 2-B (Salt Flats)	75	2614
F. & W. Rodenburg 2-A (NE Luling)	85	2221
Ogden, Dinges 3-A (Dale)	76	2240
GONZALES COUNTY—		
Osborne, Wells 1, Baume Grant	*	4289
CORPUS CHRISTI DISTRICT		
ARANSAS COUNTY—		
Atlantic, Porterfield 6-B (McCampbell)	450	7246
Porterfield 2-D (McCampbell)	725	7232
DE WITT COUNTY—		
Trinity, Bolting 1, Galletty sur	*	3800
JIM WELLS COUNTY—		
Magnolia, Seeligson 7, Los Jabon-cillos sur (perfs. 6585-95 ft)	1000	8165
Yukon, Schaefer 1, Cuellar sur 11	*	6514
LIVE OAK COUNTY—		
Glasscock, Wood 1 (Ezzell)	150	1457
Huisache, Matikin 4 (Ezzell)	150	1517
Plecher 2 (Ezzell)	180	1477
Reynosa, Nichols 1-A, Ryan sur	*	1482
Southwest, Hill 3 (Ezzell)	175	1517
Hill 4 (Ezzell)	150	1500
Sure, Ford 2 (Ezzell)	200	1546
Ford 3 (Ezzell)	200	1540
Turner, Young 1, Ayres sur	*	1013
NUECES COUNTY—		
Culton & Meaders, Bailey 1, Eliff tr subd	*	6550
Hilburn, Cody 2 (Saxet)	450	4166
Humble & Barnsdall, Webb 10 (Flour Bluff)	500	6658
Kepley, Donigan 9 (Saxet)	375	4911
Seaboard, James Luby 5 (Luby)	450	4355
Luby 7 (Luby)	500	5072
REFUGIO COUNTY—		
Hewitt & Dougherty, Lambert 63 (Tomoconnor-Greta)	1100	5939
Houston, Fannie Heard 22 (Refugio)	550	4921
Pearson, Ryals 1-C (Refugio)	*	7189
Republic Gas, Scott 1 (Refugio) (perf. 6538-50 ft)	¶5 & 200	7153
Union Producing, Fannie Heard 19 (Refugio)	675	4924
SAN PATRICIO COUNTY—		
Humble, Flinn 5 (Taft)	275	3988
VICTORIA COUNTY—		
Gulf, Bonner 1, Galban sur (Heyser)	650	5487
Mahon & Buehler 1, Poitevent sur	†	7666
LAREDO DISTRICT		
DUVAL COUNTY—		
Bridwell, Ancora 7 (North Sweden)	500	4769
DeLange, Wright & Vela 15 (Loma Novia)	*	2769
Glasscock, Farias 4 (2nd well) (North Sweden)	150	5368
Government Wells, Lundell 13 (Lundell)	125	1515
Gravis & Doran, Puig 8 (North Sweden)	500	4778
Hiawatha, Herberger 3 (Sweden)	¶30	5843
Parr 4 (North Sweden)	650	4790
Magnolia, Labbe Ranch 11 (Labbe)	105	2847
Navarro, Owens 5 (North Sweden)	275	4785
Standard of Kansas, Parr 9 (North Sweden)	350	4785
McMULLEN COUNTY—		
Ezzell, Fee 1-A (Ezzell)	52	1532
Fee 4-D (Ezzell)	¶1½	1525
Shumway, Shiner 12, Goode sur	*	1806
STARR COUNTY—		
Dean, Wood 1 (South Ricaby)	*	1869
WEBB COUNTY—		
Anderson & Stieren, Martin 2 (Oilton)	120	1907
Cox & Hamon, Garcia 5 (Oilton)	145	1922
Garcia 7 (Oilton)	125	1920
French, Perez 7 (Killam)	80	2002
H. & H. Puig 1 (Mirando City)	*	1825
Killam, Garcia & Villareal (Killam)	90	1986
Mays, Dickens 3 (Killam)	75	2009
Navarro, Perez 4 (Killam)	50	1992
Perez 5 (Killam)	59	1992
ZAPATA COUNTY—		
Texas, Whitehead 111 (Escobas)	40	1262

*Failures: †Junked; ¶Million cu. ft. gas.

Mirando district has most active week in months

Laredo.—Two Webb County wildcats were completing, a Duval County outpost was completed as an oil well, and a Jim Hogg County operation was completed as a gasser to enlarge Mirando district fields. They marked one of the most eventful weeks in several months in this Jackson sand area.

Laurel Outpost Completing

Kirkwood and Morgan's Garcia and Villareal 1, Section 720, one mile northeast of the Laurel field and three miles north of the Oilton area, is completing through perforations at 1967-74 feet to open a new oil producing area or an extension to one of the above pools. It found gas sand at 1955½-62½, broken sand and shale to 1969 feet, oil sand to 1974 feet, and shale to 2005 feet. Casing was landed on bottom.

Gasser North of Oilton

Two miles to the south, Moore and Meaders' Garcia and Villareal 1, SE NE Section 338, one mile north of Oilton production, was a gasser in the Mirando sand at 1922 feet. The test now is attempting completion in the Rosenburg sand, which showed gas at 2407-30 feet and carried oil odor below that level, but on a drill stem test at 2430-42 feet recovered salt water. The well is bottomed at 2525 feet, with test being made through perforations at 2430-35 feet.

Lonnie Glasscock's Farias 4, SW SE

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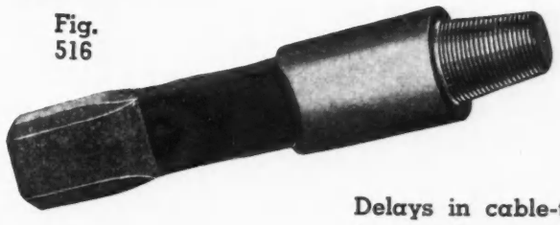
Fig. 517

STEM BOX (Heat-Treated)

Fig. 516



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NW Section 9, Duval County, extended the Pettus sand production 3600 feet to the east when it was completed for 50 barrels per day flowing through 9/64-inch choke and showing pressures of 400 pounds on tubing and 975 pounds on casing. Sand was logged 5358-68 feet.

Las Animas, Jim Hogg County, received its third Cole sand gasser and a 1½ mile southwest extension when Darby Petroleum Company's Reuben Holbein 1-C, Section 20, made an estimated 15,000,000 cubic feet of gas with 450 pounds pressure. It found the sand at 1771-1815 feet and bottom of the hole is 1865 feet.

Batesville expected to be 1938 hot spot of activity

San Antonio. — Batesville, Zavala County, is pointed out as a 1938 hot spot following the coring of highly porous, saturated Edwards limestone in H. F. Wilcox Oil & Gas Company's T. J. Gilliam 2, 660 feet southwest of No. 1, classified as the discovery well of the field.

The test encountered the limestone at 3940 feet, which was very hard and dry to 3975½ feet. The next 1½ feet of core was the saturated section. A drill stem test with sidewall packer failed and casing was set.

The action of the new well and its correlation with the first proves that the discovery completed last summer was from a crevice in the Georgetown at 3949 feet. It flowed at the rate of 210 barrels of 16.6 gravity crude per hour through open casing, but went almost entirely to water. It was first thought this flow was from Edwards limestone, which materially dampened interest in the area.

Presages Aggressive Campaign

Tens of thousands of acres of leases have been acquired in the general area by both independent and major companies and proving of an Edwards limestone field would mean an aggressive drilling program of both wildcats and field wells. The trend is entirely new to South Texas, no production being within miles of the well.

Recently, Pagenkopf and Jamison completed a well in the Austin chalk on the Houston Ranch near Frio Town in Frio County. It made considerable water from a crevice and likely will be deepened to the Edwards limestone. It further proves the importance of this new trend.

Attempts to Blow Out

Pearsall field, Frio County, again takes on the light of being an active area with Amerada Petroleum Company's Melms test, one mile east of production, attempting to blow out while drilling into the Navarro pay at 3921 feet. It now is tied up with a fishing job.

Carver Kallison Oil Company's drilling program in the new Nash Creek area of Guadalupe County has not yet provided an extension to the newly discovered crevice pool. This company has five wells either drilling or ready to start.

J. A. CLARK, assistant general manager, Lago Petroleum Company, Maracaibo, Venezuela, with Mrs. Clark and young daughters, recently arrived in California for a two month's visit.

TEXAS GULF COAST

Potential pool opener drills ahead after tenth test.

★ ★ ★

New sand extends Port Neches three quarters of mile.

★ ★ ★

Cedar Bayou wildcat to make production test soon.

Houston.—After it showed 100 feet of muddy salty water and 300 pounds pressure on a drill stem test, Shell Petroleum Corporation was drilling below 5642 feet in shale at the end of the week in McFaddin 1, McFaddin Ranch prospect, S. A. Pace Survey, Jefferson County. This potential pool opener made the drill stem test the tenth on the wildcat, from 5553 to 5570 feet in 5½ minutes through quarter-inch chokes. The first test, the best, made from 5389 to 5408 feet, showed 450 feet of pipe line oil in nine minutes and no salt water.

New Sand Found

Port Neches field, Orange County, was extended three fourths mile west last week when a new sand was discovered in The Texas Company's Stark 6, M. E. Hall Survey No. 1. Drilled to 5944 feet in sand showing oil 7-inch casing was set at 5916 feet and the well came in flowing 574 barrels daily through a quarter-inch choke. Then production fell off, the extension well finally died. The operators were forced to swab after which the well came in flowing pipe line oil. On a potential test it made 552 barrels daily through a 3/8-inch choke, with a tubing pressure of 290 pounds and a casing pressure of 590 pounds. The oil was 38.4 degrees gravity and gas/oil ratio was 415 to 1.

Port Neches field is the second field in Orange County to be extended by a new sand in the past several weeks. The other field was Orange. On the north side of the Orange field, Glenn H. McCarthy last week abandoned Brown Estate 1, Bradley Garner Survey, at 7505 feet.

Anahuac Extension

Anahuac field, Chambers County, was extended west last week when Humble Oil & Refining Company completed A. D. Middleton C-2, H. & T. C. Survey, Section 52. The well made 296 barrels daily through a quarter-inch choke with a tubing pressure of 425 pounds and a casing pressure of 1175 pounds at 7133 feet.

At Seabreeze, Chambers County, Sun Oil Company has two wells down to the new producing horizon which was discovered by Acom 3, Broussard Hebert 2, T. & N. O. Survey 127, cored oil sand from 8463 to 8490 feet and was running an electrical logging device. Hoffman 1 was waiting on cement to set at 8425 feet after coring to 8465 feet in oil sand.

Ingot and Merit Oil Company's Wright 1, wildcat in the Cedar Bayou area, Chambers County, squeezed cement through perforations at 6431 feet, set cement retainer at 6413 feet, and will make another test the coming week.

Southwest of the discovery well, Call

TEXAS GULF COAST Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
AMELIA—		
Humble, Quinn 8	681	6775
ANAHUAC—		
Humble, Johnson 19-S	676	7085
Middleton C-2	296	7133
Zappe S-6	670	7085
DICKINSON—		
Bennett & Kenyon, Way 3	551	8126
Humble, Kilgore 1	780	8970
Pure, Levin 1	552	8128
ESPERSON—		
General Crude, Moores Bluff 36	214	2511
FIVE CORNERS—		
Texas Co., Pierce Estate B-11	178	5552
FRIENDSWOOD—		
Humble, Whitcomb & Grandstaff 1	*	6175
National Standard Oil Co., Coward 1	*	lcn.
GOOSE CREEK—		
J. B. Fleming, Wright 1	40	1930
HARDIN—		
Jack Frazier, Lynott & Buffam 1-A	*	lcn.
HASTINGS—		
Humble, McDeed 3	620	6080
Stanolind, Avitts B-3	624	5460
Brown A-2	*	6155
Curkeet B-23	591	6080
HIGH ISLAND—		
Stanolind, Cade 63	50	6710
HULL—		
Houston Prod. Co., Hannah 3	345	5532
LABELLE—		
Sun, Ward 1	*	10,147
LOUISE—		
Pure, Weaver 6	177	5155
MAGNET—		
Atlantic, Cockburn 7-B	155	5541
NOME—		
Shell, Texas Public Service 4	*	6065
ORANGE—		
Glenn H. McCarthy, Brown Estate 1	*	7505
PALACIOS—		
Atlantic, Foley 3	*	lcn.
SANDY POINT—		
Henry De Arman, Edmundson 1	*	6610
TOMBALL—		
Humble, Fulton 1	6	5084
WEST BEAUMONT—		
Stanolind, Howth 1	150	5890
WITHERS—		
Texas Co., Pierce Estate C-40	74	5555
HARDIN COUNTY—		
J. G. Mayo, Haden 1, Bragg area, W. K. Griffin sur	*	6008
HARRIS COUNTY—		
H. C. Cockburn, White 1, Ship Channel area, Harris & Carpenter sur.	*	6017

*Failures, †Junked; ¶Million cu. ft. gas.

area, H. & T. C. Survey, Section 37, Houston Oil Company's Sabine Tram 2, was pulling screen and liner after the well failed to flow consistently from a new sand. Sabine Tram 2 was drilled to 7123 feet in sand showing oil. Seven-inch casing was set at 7105 feet. The well came in flowing pipe line oil, flowed for three hours and then went dead. Tubing pressure was 100 pounds and casing pressure was 625 pounds. The company has made location for Sabine Tram 3, H. & T. C. Survey, Section 37.

Outpost Sets Casing

South of production at Hardin, Liberty County, Humble Oil & Refining Company was setting 7-inch casing in Chambers 1, A. B. Hardin Survey. The hole was drilled to 7588 feet. The core from 7575 to 7585 feet was missed, and only one foot of sand was logged from 7585 to 7588 feet.

Stanolind Oil & Gas Company is preparing to install flow valves on Oates 1, Clinton area, Harris County. It was swabbed and showed 85 percent washwater and 15 percent oil at 3835 feet.

On the Houston Ship Channel, H. C. Cockburn abandoned White 1, Harris and Carpenter Survey, at 6017 feet in shale. Salt water sand was logged from 5325 to 5330 feet.

Southeast of production at Friendswood, Harris County, Humble Oil & Refining Company abandoned Whitcomb and Grandstaff 1, T. Choate Survey, at 6175 feet in salt water after encountering the top of the sand at 6153 feet.

On the northeast side of Dickinson field, Galveston County, Pure Oil Company completed Levin 1, W. G. Banks Survey, at 8128 feet, flowing 23 barrels per hour through a quarter-inch choke, with a tubing pressure of 600 pounds and a casing pressure of 1050 pounds.

War Department gives Texaco permission to drill in lake

Washington, D.C.—Issuance of a permit to The Texas Company for exploratory drilling in Lake Mongoulis, St. Martin Parish, Louisiana, was announced December 7 by the Chief of Engineers of the War Department.

The department made public a number of permits which have been issued for construction work in navigable waters under its control, including the following:

The Texas Company, for structures and appurtenances to be used in connection with the drilling of exploratory wells for oil and gas production, wharves, tanks, pump and other foundations in Lake Mongoulois.

The Texas Company, for derrick structures, wharves, walks, tank, pump and other foundations; driving and maintenance of piles and clusters of piles in connection with operations in Vermilion Bay, Iberia Parish, Louisiana.

The Texas Company, for construction of oil well structures in navigable waters of Lake Fausse Pointe, near Dauterive Landing, Louisiana.

Stanolind Oil & Gas Company, for placing temporary pipes for seismographic work in Matagorda, Lavaca and Kellers Bay, Texas.

Stanolind Oil & Gas Company, for placing temporary pipes for seismographic work in Copano Bay, Texas.

Nine tests loom as pool openers as year nears end.

* * *

Continental completes second oil well in Abbeville.

* * *

Potash well blows mud, oil and sand from 647 feet.

Lake Charles.—As the year nears an end there are nine wildcats in the district down to interesting depths after having indicated possibilities of opening new producing territories.

The shallowest and best sand yet discovered at Charenton, St. Mary Parish, was found in Pan American Production Company's Ecuir 1-B. Forty-six feet of oil sand was logged from 1860 to 1906 feet and the hole was carried to 2600 feet. A 12-pound mud was used in the hole to keep it from blowing out, and oil was shown on the ditches while drilling. Electrical logging showed good porosity and resistivity. Seven-inch casing has been set at 1910 feet and a production test will be made over the week end.

Woodlawn Due First

Probably the next oil field in the South Louisiana area will be Woodlawn, Jefferson Davis Parish. Union Sulphur Company's Calcasieu National Bank 1, Section 12-9s-8w, set 6⅝-inch casing at 8524 feet and will perforate several likely sands. Sands at 8454 to 8461 feet showed seven ohms and 120 milivolts; 25 ohms and 120 milivolts were shown at 8280 to 8290 feet; from 8279 to 8280 feet eight ohms and 60 milivolts were shown, and from 8268 to 8279 feet, 12 ohms and 100 milivolts were shown on the electrical logging device. All of them showed oil when cored.

Northwest of Starks field, Jefferson Davis Parish, Humble Oil & Refining Company's Stegall 1, Section 20-9s-5w, was down to 7389 feet last week. Sand showing oil was logged in this wildcat from 6989 to 7000 feet.

On the South Crowley prospect, Acadia Parish, Humble Oil & Refining Company's Sarver 1, Section 35-10s-1e, tried to blow out at 10,201 feet after logging top of the gas sand at 10,191 feet. Last week the well was down to 10,226 feet in shale.

Gets Salt Water

D & D Oil Companys Lutcher Moore 2, northwest of Starks, Section 1-8s-13w, appeared disappointing last week when salt water was shown on a drill stem test. However, the well is plugging back to 8400 feet, where another test will be made. It was drilled to 9674 feet and casing was perforated from 8550 to 8560 feet with 19 holes. Salt water was shown and a cement retainer was set at 8622 feet. A drill stem test from 8500 to 8622 feet showed 45 stands of gas cut mud and salt water through quarter-inch choke.

West of Starks, Republic Production Company's Sabine Tram 1, Section 25-18s-14w, Calcasieu Parish, was still cutting and pulling at 9670 feet after sticking the drill stem. A gas sand was topped at this depth and the wildcat attempted to blow out.

Test in Gulf Sets Pipe

Superior Oil Producing Company set 7⅝-inch casing at 7116 feet in State Gulf of Mexico 1, in Gulf of Mexico, one mile off the shore of Cameron Parish. Sands showed oil at 5110 to 5182 feet and 6708 to 6711 feet. After drilling deeper the company will plug back and test them.

Thirty feet of oil sand was cored in Amerada Petroleum Corporation and Louisiana Land & Exploration's South Coast Corporation 1, Raceland, Section 34-15s-19e, from 10,180 to 10,210 feet and at the end of the week the well was still in oil sand. This is the second oil sand logged in this wildcat. The first sand was picked up around 7240 feet.

At Timbalier Bay, Lafourche Parish, Gulf Oil Corporation is still doing geophysical work at 8728 feet in State PP 3, Section 36-23s-21e. The well indicated it would open a new oil field when two drill stem tests showed commercial oil.

The Texas Company made a drill-stem test on State Bateman Lake 1, South of Morgan City, Section 21-16s-12e, and recovered salt water. The hole will be cemented back and formations up the hole tested. After setting 5-inch casing onto 7⅝-inch casing was perforated from 10,978 to 10,985 feet and recovered 4300 feet of salt water. While drilling to 11,879 feet this wildcat showed oil sands at 9600 feet, 9900 feet, and 10,425 feet.

Bateman Bay Looks Good

The second oil producer at Abbeville, Vermilion Parish, was completed last week when Continental Oil Company's Hebert 1, the original distillate discovery well was reconditioned and completed in the same sand as Brookshire 1. Hebert 1, Section 20-12s-3e,

was drilled below 12,000 feet, plugged back, and opened the area for distillate production when it came in at 7666 feet. Brookshire 1 was drilled and completed at 7890 feet. The company then killed Hebert 1 and perforated at 7893 to 7897 feet. It came in flowing 226 barrels of 42.1 gravity oil in 19½ hours through a 5/32-inch choke, with a tubing pressure of 1400 pounds and a casing pressure of 1300 pounds.

Blowout at Potash

In the Potash area, Plaquemines Parish, where one well has made a small amount of 25 gravity oil, Humble Oil & Refining Company's Orleans Levee Board 22, Section 10-18s-15e, blew out last week making mud, oil and sand from 647 feet. The well was drilled to 851 feet in gyp, after logging top of the formation at 805 feet and cap rock from 788 to 805 feet. When the crew was setting 10-inch casing at 647 feet the hole blew out. A short string of 8-inch casing has been set at 805 feet. It is believed that this well will be the first commercial producer for the district.

The same operator's Orleans Levee Board 24, Section 13-18s-15e, was down to 1190 feet in gyp showing oil. Top of the formation was encountered at 1106 feet. Eight-inch casing has been set at 1062 feet. A trace of oil was found at 962 to 982 feet. Orleans Levee Board 26, Section 11-18s-15e, was down to 583 feet and logged sand showing oil from 418 to 420 feet.

Jennings Flank Test Shows

On the north flank of Jennings, Acadia Parish, Superior Oil Producing Company logged 54 feet of sand showing oil last week in J. Clement 1, Section 46-9s-2w. The lower portion showed salt water. The hole was down to 5997 feet in shale at the end of the week. The company will try to pick up the deep sand found on the south and west flanks.

Southwest of production at North Crowley, Acadia Parish, Humble Oil & Refining Company abandoned Zaumbracher 1, Section 4-9s-1e, after failing to pick up the main producing horizon. Habetz 1, southeast of the discovery well, also appears a failure. It was down to 9039 feet, below the producing sand.

Union Sulphur Company is drilling cement plugs in J. O. Hebert 2, Big Lake field, Section 18-12s-8w, at 9180 feet to test a new sand. Seven-inch casing was set on bottom after an electrical logging device showed three ohms at 9114 to 9116 feet, 6½ ohms from 9123 to 9128 feet, and 4½ ohms from 9133 to 9137 feet.

SOUTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ABBEVILLE—		
Continental, Hebert 1 (wo)	312	7897
DARROW—		
Humble, Gumble 12	672	6985
JENNINGS—		
Ladak Oil Co., Jennings Clements 3	115	1997
NORTH CROWLEY—		
Humble, Zaumbracher 1	*	9274
SULPHUR—		
Union Sulphur, Fee 851	283	5137

*Failures; †Junked; ¶Million cu. ft. gas.

NORTH LOUISIANA

Small gas-distillate well defines Rodessa on northeast

Shreveport.—Northeast limits of the Rodessa field were apparently further defined last week when Freeman W. Burford's U. S. Government 1, NE SE SW 6-23n-15w, Caddo Parish, was completed after being tested in the Gloyd formation for four barrels of distillate and one million feet of gas in 24 hours. Depth was 6115 feet, and seven-inch casing was cemented at 6038 feet. Slightly saturated sand was logged from 6031 to 6042 feet in the Gloyd topped at 6014 feet; elevation is 346 feet.

This test is one mile southeast of production in the Arkansas side of Rodessa and one mile northeast of production on the Louisiana side. It is a quarter of a mile north of Standard Oil Company of Louisiana's J. W. Farmer 2, Section 7-23n-15w, completed as a small gas well.

Six New Locations

The part of the Louisiana side of Rodessa in Sections 2 and 3-23n-16w, just south of production in Arkansas, has become the most active part of the Louisiana side of the field, six new locations having been announced there last week.

The Arkansas side of Rodessa added four new wells last week to bring the total to 52 producers. Three new locations were made there. The Marion County, Texas, end of Rodessa added one new well last week to bring the total to 35 oil wells.

Has Several Showings

E. T. Oakes, H. D. Easton and associates' Griggs 1, C SW 36-18n-1w, Lincoln Parish wildcat, was coring lime and shale in basal Glen Rose last week at 5407 feet after logging several showings of gas and distillate and one slight show of oil in oolitic lime of that formation. Contract depth is 6000 feet.

This test, which with elevation of 199 feet logged massive anhydrite from 4253 to 4713 feet, had gas-distillate showings at 4903 to 4921 feet, at 4935 to 4955 feet, at 4980 to 4990 feet, and from 5173 to 5191 feet. The core from 5314 to 5326 feet showed stain and had an odor of oil.

A. O. Olsen and associates' R. T. Sharpe 1, Section 15-18n-16w, tested considerable gas last week at 5624 feet and then was acidized.

Standard Oil Company of Louisiana's lower Marine test in Sugar Creek, Claiborne Parish, was coring at 8090 feet. It is Brownfield 2, C SE NW 5-19n-5w.

Two Deep Tests to Spud

Bad weather and roads, as well as the impending holiday season, contributed last week to a slackening of new activity in North Louisiana, especially in wildcatting, but there were two outstanding exceptions.

Two test, for 9000 and 10,000 feet, respectively, were scheduled to spud soon as rigging was rushed to completion last week.

Magnolia Petroleum Company plans to spud by December 15 in Sexton 1, C SE NW 32-23n-9w, proposed 9000-foot lower Marine test in the shallow Shongaloo gas field, Webster Parish. J. G. Sutton Oil Company planned to spud by December 14 in Sabine Lumber Company 1, SE NW NE 23-7n-14w, proposed 10,000-foot test in West Zwolle, Sabine Parish.

Lisbon Runs

Total cumulative pipe line runs from the Lisbon field, Claiborne and Lincoln parishes to December 1 were 2,152,401 barrels. Since the first well was completed at Lisbon last December 25 by E. T. Oakes, H. D. Easton and associates, to December 1, 147 producers had been completed. No dry holes have so far been completed and the limits have not been defined although wells to the northwest and northeast have shown signs of "pinching out" insofar as porosity was concerned.

Caddo Pipe Line Corporation (Grogan Oil Company) is running 5000 barrels of Lisbon oil daily and Gulf Refining Company, 2000 barrels.

Shreveport.—V. A. Hughes & Company last week started moving in materials for a wildcat test in western Cass County, Texas, 7 miles north of the town of Hughes Springs, T. C. Lyster 1, (322.4-acre tract), William Bateman Survey. It is on a block of 7000 acres and contract depth is 4800 feet. Tests will be made of the Nacatosh, Blossom (Ozan) and Woodbine formations. Three geophysical parties have worked the area.

South of Gulf Oil Corporation's Pierce & Chesbro 1, J. H. Shahan Survey, Panola County, Shell Petroleum Corporation has contracted to lease 3000 acres of Louis Werner Sawmill Company land, provided 2000 acres additional can be secured. In the same county south of the village of Deadwood, Magnolia Petroleum Company is leasing.

In the northeast part of the Miles Reed Survey, Marion County, west of Jefferson, Shell Petroleum Corporation has a seismograph unit working.

Portex Oil & Gas Company announced last week it planned to drill 5 tests in the Joaquin gas field, Shelby County, where it now has three gas-distillate wells producing from the Glen Rose. It previously had announced plans for an extraction plant.

NORTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO PARISH (Rodessa)—		
F. W. Burford, Government 1, 6-23n-15w	¶1	6115
H. Vaughn, Yates 2, 2-23n-16w	560	6060
CLAIBORNE PARISH (Lisbon)—		
Sloan & Zook, Patton 1, 1-20n-5w	960	5404

*Failures; †Junked; ¶Million cu. ft. gas.

Third lower Marine well at Schuler largest in long time

El Dorado, Arkansas.—The lower Marine horizon at Schuler, which produces a sour crude from below 7500 feet—the 5500-6000 foot lenses yield sweet oil—added its third producer last week, the largest well completed in a long time in Arkansas, and also gave indication of another producer from that horizon before the week closed.

The third producer was Phillips Petroleum Company's Ed Gan 1, SWc SE NE 18-18-17, which had cored a well-saturated "Jones" sand in the lower Marine from 7530 to 7604 feet; elevation is 232 feet. The well was plugged back from 7700 feet and 7-inch casing set at 7687 feet, was perforated with 207 shots from 7535 to 7560 feet. The well was completed flowing 181 barrels per hour through 1½-inch choke with casing pressure 700 pounds and tubing pressure 140 pounds, with about three percent wash water and basic sediment, but no salt water. The gas/oil ratio was 350 to 1.

On the first 24-hour gauge the well produced 4159 barrels of net oil through same size choked.

Alice Sidney Oil Company's D. S. Morgan 2, Section 18-18-17, completed the week before, made 1928 barrels of oil on 24-hour gauge through 70/64-inch choke with a tubing pressure of 90 pounds and a casing pressure of 1355 pounds. On the same day last week Edwin M. Jones' Marine Oil Company 1, Section 17-18-17, discovery well of the lower Marine, made 1091 barrels of net oil, plus 72 percent salt water, through 29/16-inch choke, with a tubing pressure of 200 pounds and a casing pressure of 2380 pounds. This well completed last summer has made varying amounts of salt water since completion, origin of which has not been definitely determined.

Meanwhile, the fourth oil producer from the lower Marine appeared assured when Edwin M. Jones and Associates' Marine Oil Company 2, SW NW SE 17-18-17, started flowing 70 barrels of fluid December 9, through open tubing after casing had been perforated from 7585 to 7607 feet. Top of Jones sand was 7581 feet. Depth was 7950 feet, and 7-inch casing was cemented at 7679 feet. Elevation is 254 feet.

Two 24-hour gauges on the new discovery Permian lime oil well at Buckner, Columbia County, Arkansas, Standard of Louisiana's J. P. McKean 1, SW SW 8-16-22, showed 422 barrels through ⅛-inch tubing choke, with a tubing pressure of 725 pounds and a casing pressure of 760 pounds; and 475 barrels from the same size choke, with tubing pressure 650 pounds and casing pressure 675 pounds.

Post Lower Price for Sour Crude

Root Petroleum Company which is buying the sour crude from the three present lower Marine 7500-foot oil producers in the Schuler field, Union County, Arkansas, has posted a price of 96 cents per barrel which is 10 cents per barrel below the gravity scale of the sweet oil being produced from the five lenses in that field between 5500 and 6000 feet.

Root Petroleum Company has connected with Phillips Petroleum Company's Ed Gan 1, Section 18-18-17, at Schuler, and Alice Sidney Oil Company's Morgan lease, same section, these being the two latest lower Marine producers at Schuler. The company was already buying the oil from Edwin M. Jones' Marine Oil Company 1, the discovery well of the lower Marine horizon in that field. It has also connected to the Marine Oil Company's leases at Schuler.

American Liberty Oil Company has leased 2500 acres in Bradley County, Arkansas, in Township 15, Range 10, which is north of any "trend" receiving recent attention in South Arkansas.

Considerable geophysical activity continues in South Arkansas. In Columbia County, Tidewater Associated Oil Company has a seismic unit working in Township 18, Range 19, and in the same county near Buckner, where Standard Oil Company of Louisiana has just opened an oil producing area in Section 8-16-22, Atlantic Refining Company has a seismograph unit at work.

Two new casinghead plants for Rodessa

Shreveport. — One new casinghead plant started operations in the Marion County, Texas, end of Rodessa last week and another in the Miller County, Arkansas, part of the field is scheduled to start December 15.

In the James Hanks Survey, Arkansas-Louisiana Gas Company has begun part-time operation of a casinghead plant. It will be in full operation by January 1. Daily capacity of the plant is 25,000,000 cubic feet of gas and 15,000 gallons. There are 35 producing wells in Marion County's end of Rodessa, and connections are planned to about 80 percent of them at an early date.

In Miller County, Arkansas, the first casinghead plant, that of East Texas Refining Company, with three units of 10,000,000 cubic feet of gas each, will have 45,000 gallons daily. It is in Section 14-20-28. R. H. Turner will be superintendent of the plant, which at first will not operate at full capacity.

ARKANSAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MILLER COUNTY (Rodessa)—		
F. W. Burford, August 1, 8-20-27..	40	6230
NEVADA COUNTY—		
W. E. Lokey, Tr., Purifoy 1, 17-11-20	†	2220
OUACHITA COUNTY—		
O. F. Whittaker, Guttrt 1, 21-15-19	7	2180
UNION COUNTY—		
W. D. Wingfield, Southern Kraft 2, 18-16-14	*	2728
UNION COUNTY (Schuler)—		
Alice Sidney Oil Co., Morgan 2, 18-18-17 1779		7700
Phillips, Gan 1, 18-18-17 4159		7700
MILLER COUNTY (Rodessa)—		
W. L. McClanahan, Hopkins B-1, 11-20-28 1400		6100
McMurrey et al, Thomas Bros. B-1, 13-20-28 360		6141
J. R. Orstrom, Gerrald B-1, 15-20-28	90	6189
Texas Canadian Oil Corp., Thomas 2, 12-20-28	480	6090

*Failures; †Junked; ¶Million cu. ft. gas.

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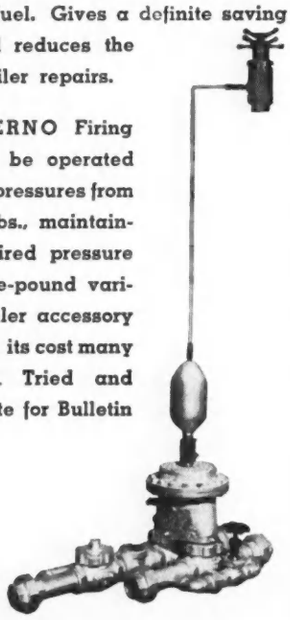

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ILLINOIS DEVELOPMENTS

Cold weather noticeably curtailing drilling work.

* * *

Indicated that Coal Basin production is long lived.

Olney, Ill.—Oil interest moved into Olney's back yard last Tuesday when Vickers & Frost's W. H. Farris, Section 18-3n-10e, Olney Township, Richland County, 3 miles south of here, cored several feet of what was described as an "excellent" McCloskey saturation below 3050 feet. Operators, confident it will make a commercial well, will drill in with cable tools. It is the second try in the township, R. Neeley et al's Baughman 1, Section 22-3n-10e, failing to find saturation when drilled to 3252 feet last summer. Pits are being dug for the township's third test by the Bur-Kan Drilling Company on the R. C. Allen farm, one mile north of the city.

Mammoth Oil & Refining Company's Brace-McCauley 1, wildcat in Section 28-3n-9e, Decker Township, Richland County, which was reported a week ago as kicking off at the rate of 200 barrels the first hour while being swabbed and which was said to be estimated at 1700 barrels initial, was flowing during the week, but apparently an obstruction in the bottom of the hole was holding it down. The hole is to be probed with cable tools in an effort to remove the obstruction, believed to be a disc placed when tubing was set.

Benedum & Trees Oil Company chalked up its third dry hole in its 4-well drilling campaign for Wayne County when the Rose Yates 1, Section 33-2n-7e, Bedford Township, failed to find commercial production after drilling to 3272 feet. The company had previously plugged Arthur Knapp 1-A, Section 12-1n-6e, Indian Prairie Township, and the Earl Craig 1, Section 28-2n-7e, Keith Township. The remaining well is Arthur Knapp 1, Section 33-2n-7e, Keith Township, which is producing a little oil.

Probably more noticeable because cold weather is slowing operations, the new Illinois oil area opened early this year is fast losing its boom aspect which was so marked during the past summer and early fall. Indications that the coal basin area is taking on a more quiet or conservative manner are found in a study of production figures and a survey of current drilling operations.

With slightly over 200 producing wells, daily production is now somewhat above the 20,000-barrel mark. This figure is slowly advancing and may possibly reach the 25,000-barrel mark by the end of the year. A study of production records of individual wells drilled early this year strengthens the belief that the new fields will, like the old fields opened several decades ago, be long-lived. Production has remained steady after flush production wore off. Pumping equipment has been installed on many leases.

As each week brings recorded failures of wildcats well removed from the Wayne-Richland-Clay County area, there are few new tests started to continue the more rampant type of wildcatting which was prevalent several months ago. Many wildcatters who flocked north and east to Illinois this summer have returned to warmer climes with the approach of winter weather and the realization that Illinois will probably produce no sensationally large gusher-type wells.

In DeKalb County, northeastern Indiana, DeKalb-Steuben Oil & Gas Company is testing George Milks 1, Section 5-35n-13e, at 2560 feet.

ILLINOIS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BOND COUNTY—		
Huber Drlg. Corp., Kuntz 1	*	3102
CLINTON COUNTY—		
Bartelso O&G Co., Schlarmann 3	80	997
EFFINGHAM COUNTY—		
Kingwood Oil Co., Bartels 1	*	4102
Carter, H. Pruener 1	*	2600
HAMILTON COUNTY—		
J. G. Buell, Dickey 1	*	3499
MARION COUNTY—		
Shell, Lutz 1	*	1706
Alexander et al, Allison 2	*	1477
RICHLAND COUNTY—		
Roberts et al, Hannah 1	1400	2953
Carter, Watkins 3	1090	3018
Ohio, Arbuthnot 6	810	2974
WAYNE COUNTY—		
F. R. Washburn Pet. Corp., Accola 1	*	3042

*Failures; †Junked; ¶Million cu. ft. gas.

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HOUSTON, TEXAS

Porosity Is More Important Than Structure in McClosky

By JOHN C. ALBRIGHT

ACTIVITY in the Illinois Coal Basin is now centered in the village of Noble, where 25 derricks have been erected recently, principally on town lot development. The Noble townsite wells will undoubtedly recede rapidly from the first peak production, as others completed in the McClosky have done in other areas.

Production from all wells in the Basin proper is estimated at about 16,000 barrels daily, practically all which is being produced from the McClosky, picked up at an average depth of 2980 feet. The thickness of this formation varies widely from well to well, and in many instances it has been so tightly cemented that production has been obtained with difficulty. As a rule, when the formation is unusually tight, acid treatment has been resorted to so a well can be completed. Several wells so treated have been surprisingly large producers, while a few wells showing adequate porosity have been disappointing.

Why Some Are Small

While many companies in the Basin have been busy with seismograph crews, working out structures, it is being discovered daily that porosity has more to do with oil production in the McClosky than structure. The oolites in the St. Genevieve are fairly general, and have been found at various depths in all wells drilled to date, but with the lack of reservoir pressure, coupled with advanced cementation, many wells have been small producers.

The Clay City pool opener was drilled by Pure Oil Company on the B. Travis farm and completed on May 19, 1937, for an initial production of 2560 barrels. Since that time, this area has been almost completely drilled up, with all wells being put on the pump as rapidly as possible. Pure Oil has standardized in this pool with geared powers, operated with twin cylinder horizontal gas engines. Wiser Oil Company, on its D. Smith farm has 11 wells and one lease power completed. Outlying wells, considered too distant for central power pumping, are being produced with individual jacks powered with multicylinder gas engines.

Mostly Rotary Now

Since the discovery well which was drilled with cable tools, practically all of the recent completions have been drilled with rotary tools, receiving power generally from gas or Diesel engines. Water in the basin is secured with difficulty by operators having small leases. They haul it in tank trucks from "borrow" pits beside the highways.

Characteristics of the McClosky are such that when a well is drilled, it comes in for its greatest production the first day, and when an offset is completed, both wells tend to seek a common level; therefore, the first well down to pay is the one usually that provides the greatest returns to the owner. Speed is of paramount importance.

Several of the Mid-Continent contractors have moved tools into this area, and each one has a different idea about drilling through the formation overlying the St. Genevieve. Some strings of tools are operated at what seem excessive speeds, with the table revolving above 100 r.p.m. and at the same time all of the drill pipe weight resting on the rock bit. This procedure naturally is quite expensive, so far as bits are concerned, yet the drillers contend that hole can be made much more rapidly in this manner than if they were using slower table speeds. The smallest number of hard formation bits used on a single well was reported to be 12, with the average being in the neighborhood of 18.

Again, some contractors disregard the character of drilling muds until about 2500 feet, when they condition with a commercially prepared clay mixture that will stand up in the presence of salt water. Native muds seem to be totally unfit for conditioning drilling fluids, but experiments are being conducted at the present time by one concern that hopes to develop a clay supply for the basin. Other contractors make it a practice to condition the pits at the time drilling is started. Weights are usually carried at about 10.4 pounds, with the viscosity around 38 to 40.

The procedure generally followed is to set about 220 feet of 10-inch surface pipe, cemented in some cases with 10 sacks of cement. Some merely set the pipe down on top of rocks below the drift on a common shoe. The hole below the surface is generally made with 8¾ hard formation bit, until the approximate level of the McClosky is reached. There coring is begun. All wells are cored, irrespective of results obtained on offset locations, as the pay is found at surprisingly irregular depths. After concluding coring, 7-inch O.D. casing is run, generally cemented with from 100 to 150 sacks. In a few wells, cores showed only a thin section of the McClosky, the oil string was landed on a Texas pattern shoe in a seat prepared with a tapered reamer. This feature has both advantages and disadvantages. If the well cannot be made to produce, 100 percent salvage can be obtained on the long string of pipe. But if acidizing is carried out with large and exceptionally strong volumes, seats may be impaired, permitting infiltration of water.

Fuels Used

Fuel used in the basin consists of gas, gasoline, Diesel oils and coal. In one of the newer pools, a few rigs are operated with two boilers, using crude oil for fuel. These rigs were shipped in from South Texas, complete with derricks and other equipment, and are being used in Clay County.

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Up-Trip shown at left.

Pack-Off Shoe shown at right.

The Cavins Perforation Washer is unequalled for cleaning perforated oil strings, liners and screens; permitting a well to produce regularly and efficiently. It is convenient, efficient, and easy to use, and can be assembled in twenty minutes. It consists of The Cavins Bailer with The Cavins Up-Trip and Pack-Off Shoe (illustrated); and requires no special rigging up—a great time saver. It's the best insurance available against losses of time, labor and production, and will pay for itself many times each year. Write for illustrated, descriptive bulletin.

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The CAVINS PERFORATION WASHER

EASTERN FIELDS

New York-Pennsylvania area has 16 successes

Pittsburgh.—Two completions were reported in the New York-Pennsylvania deep sand gas area, both in the recently opened Woodhull Township field of Steuben County, on the New York side. They bring the number of successful completions in this field to 16, with the first failure still to be reported. Largest of the two was by Belmont Quadrangle Drilling Company on the L. S. Johnson farm, which topped the Oriskany at 4029 feet and had an open flow of 8,000,000 cubic feet a day when bottomed at 4039 feet. Cunningham Natural Gas Company completed J. J. Johnson 1 with an open flow of 6,000,000 cubic feet. The Oriskany was topped at 3977 feet and the test bottomed at 3995 feet. New operations were announced for each side of the New York-Pennsylvania line. A rig is already up on the H. O. Perry farm, Genesee Township, Potter County, on the Pennsylvania side, which will be drilled by Franchet et al, while Belmont Quadrangle Drilling Company will drill 100 feet from the junction of the north and west lines of the F. Hilligas farm, Willing Township, Allegany County, New York.

In the old Allegany field, C. W. Foster is starting a 20-well program along 5-spot lines on his recently acquired Waters Estate lease, Allegany Township. The property consists of 60 acres, with 10 oil wells now producing. Construction of a water treatment plant is to be started on the lease immediately. Chan Wasson, of Duke Center, Pennsylvania, has been awarded the drilling contract and will use three rigs. The development program is under the direction of William Thyng, of Olean, New York.

The monthly report of M. M. Fidlar, state gas supervisor of the Indiana department of conservation, division of geology, shows a marked increase in activity in that state. Much of the prospecting is in the western part of the state, adjacent to the coal basin area of Illinois, and dry holes resulting from wildcat tests are not infrequent. Twenty-four wells were completed in Indiana during the past month, of which 7 were producers, 10 were gas wells and 7 were failures. At least 14 of the 24 completions were at depths under 1000 feet. An additional 23 wells were drilling as the month closed, with 1 fishing, 8 idle, and 2 about to start operations.

While deepening its test in the Oriskany sand on the H. A. Shirkey farm, southwest of Sissonville, Kanawha County, West Virginia, United Fuel Gas Company suffered a fire which destroyed the rig and threatened two nearby 500-gallon gasoline storage tanks. Eleven men were burned, none critically, and the well burned for two days before being put out with steam, water and chemicals. Everett Ferrell, Charleston, drilling contractor, was one of those injured. The bit broke off while the test was being deepened and the tools were brought to the surface and rested on a wrench in the hole. The gas, gauged at 10,000,000 cubic feet, spread to the engine and the gas ignited. A truck belonging to the drilling contractor and parked near the derrick was also destroyed by the flames.

EASTERN FIELDS
Completions

OHIO

Company, Well and Location	Init Prod. Bbls.	Depth
ATHENS COUNTY—		
B. Johnson, J. L. Winnar 1	¶.22	1970
Speary O&G Co., Dorr 1	¶.06	1429
COSHOCTON COUNTY—		
Pure, Harry Carpenter 5	10	3380
GUERNSEY COUNTY—		
Ronshausen et al, Gillespie 5	¶.07	1210
Hayes Ferguson, Keith 1	*	1560
Cambridge Glass Co., Barrett 1	*	1362
KNOX COUNTY—		
C. A. Davis et al, Veatch 1	115	....
Claremont O&G Co., J. B. White 1	¶1	2780
LAWRENCE COUNTY—		
Portage Producers, Inc., Cambria Clay Products Co. 2	¶.05	812
LICKING COUNTY—		
Settles Oil Co., Shannon 3	5	765
North Fork Oil Co., Williams 12	2	650
Hoover Bros., Wells 1	¶.06	610
MEDINA COUNTY—		
Shamrock Oil Co., Meyers 12	3	476
D. A. Eakin, Broadsword 16	*	400
Broadsword 17	*	400
MEIGS COUNTY—		
Harry Smith, Athens-Pomeroy Coal & Land Co. 4	¶.20	840
Ohio F. G. Co., Wogan 2	¶.19	860
MONROE COUNTY—		
Beachgrove Oil Co., Hartshorn 2	¶	1100
Heisler O&G Co., Marsh 9	*	1640
MUSKINGUM COUNTY—		
Pure, Angie Fraser 1	75	3270
E. H. Everett Co. et al, Vroom 2	10	3300
NOBLE COUNTY—		
Preston Oil Co., Davis 2	¶.31	1137
Harriettsville O&G Co., Lovett Heirs 5	*	1592
PERRY COUNTY—		
Big Run O&G Co., Weaver 1	¶.50	1062
Ohio F. G. Co., Yanger 1	¶.40	2935
SCIOTO COUNTY—		
Earl McKenzie, Fee 1	¶.01	362
STARK COUNTY—		
East Ohio Gas Co., Willowdale Country Club 3	¶1	4280
Jacob Kropf 1	¶.21	4608
WASHINGTON COUNTY—		
Anderson et al, Vickers 5	4	1275
Newhart O&G Co., B. W. Rinard 5	2	1740
Wm. B. Depuy et al, Epler 1	¶	980
WAYNE COUNTY—		
Ohio Salt Co., Fee 2	*	3500

WEST VIRGINIA

BOONE COUNTY—		
Cambridge Gas Co., Wiseman 13	¶.07	3809
BRAXTON COUNTY—		
C. J. Belknap et al, Belknap 1	¶1	1708
Pittsburgh & W. Va. Gas Co., Parkersburg Mill 13	¶.68	1592
CALHOUN COUNTY—		
Hope Nat. Gas Co., Pell Estate 7797	¶.70	1590
G. S. Wilson 7787	¶.13	1957
GILMER COUNTY—		
Louis Wohine, L. S. Young 1	¶.85	1687
H. Farrell, G. Sommers 1	¶.43	1758
Pittsburgh & W. Va. Gas Co., Lloyd 7624	¶.15	1816
KANAWHA COUNTY—		
Godfrey L. Cabot, H. Morton 1	¶18.20	4981
B. M. Dulaney 1	¶8	5037
Lima Gas Co., Moss 1	¶15.28	5167
Columbian Carbon Co., Glass 1	¶13.58	4996
Owens Illinois Glass Co., Siler Coal Land Co. 4	¶.41	4750
LINCOLN COUNTY—		
Guyan Oil Co., Huntington 1	50	1430
South Penn Oil Co., Dunlap 2	5	2407
Martin Gas Co., Hager & McComas 1	¶.65	3333
MONONGALIA COUNTY—		
Ira Donley, Sutton 1	¶.13	2139
Maxon Oil Co., Kennedy 2	*	3300
RITCHIE COUNTY—		
W. Va. Investment Co., Parks 22	*	2029
ROANE COUNTY—		
Ohio Valley Gas Co., Larch 2	*	5448
WETZEL COUNTY—		
South Penn Oil Co., Moore 3	8	3300
WIRT COUNTY—		
R. C. Waggoner, Pribble 1	*	3042
WOOD COUNTY—		
Rutherford Oil Co., Cuthbert & Carle 13	1	490
Albert Congdon, Geo. Grant Hrs. 8	*	2250

KENTUCKY

DAVIESS COUNTY—		
S. J. Sherman, Johnson 2	*	960
FLOYD COUNTY—		
Kentucky-W. Va. Gas Co., Dillion 559	¶2.46	1426
HANCOCK COUNTY—		
C. D. Walker, Boling 3	20	383
Galey & Fletcher, Hall 1	¶.09	380
Frank Dameron et al, Boling 5	*	570
John Bruner 2	*	612
LEE COUNTY—		
South Penn Oil Co., Flahaven Land Co. 96	5	....
OHIO COUNTY—		
A. D. Noe et al, Crawley 5	20	520
Snowden & McSweeney, Howard Hrs. 29	10	....
Frank Randall et al, W. C. Hoover 10	5	577
Boling & Callas, Simmerman 5	¶1	1402
A. Teller et al, Farmer 7	¶.09	680
Moss Oil Co., Lyons 4	¶.08	585
Globe Oil Co., C. M. Farmer 5	*	....
Taylor & Likens, Bartlett Hrs. 3	*	458
Clark & Snyder, Louisville Land Bank 2	*	1475
WEBSTER COUNTY—		
Sellers & Koker, Powell 2	20	440

PENNSYLVANIA

GREENE COUNTY—		
Carnegie Natural Gas Co., J. W. Milliken 3	20	3140
Fred Garrison, Stoneking 1	¶.07	1935
Equitable Gas Co., F. P. Iams 2	¶.05	3278
Wm. Smith et al, Phillip Fonner Heirs 1	*	2935
Manufacturers Light & Heat Co., Albert Lyons 1	*	2642
WASHINGTON COUNTY—		
Keystone Gas Co., H. W. Davidson 1	¶.50	1134
NEW YORK—		
Belmont Quadrangle Drilling Co., L. S. Johnson 1	¶8.00	4039
Cunningham Natural Gas Co., J. J. Johnson 1	¶6.00	3995

INDIANA

DAVIESS COUNTY—		
Lloyd, Oliphant & Sage, Eva Fuhrman 3	¶	575
Paul Fuhrman 2	¶	584
Midwest Development Corp., Martin Nolen 4	¶	439
Jas. Lannon 2	*	650
Kentucky Natural Gas Corp., W. L. Evans 1	*	710
DEARBORN COUNTY—		
Dearborn Development Corp., Louis Schusterman 1	¶	281
GIBSON COUNTY—		
Midwest Development Corp., Carl F. Mans 1	¶	427
JAY COUNTY—		
Claude Thompson, Mary A. Hauser 1	20	....
KNOX COUNTY—		
Shaker O&G Co., Nellie Walden 4	¶	....
PERRY COUNTY—		
Hollingsworth Gas & Oil Corp., Eliz. Grammelspacker 5	3	543
PIKE COUNTY—		
Murphy Oil Co. of Pa., Essie Stewart 3	¶	1181
Claude L. Trusler, Geo. W. Ward 1	¶	1186
Midwest Development Corp., Harold Campbell 1	*	882
Huber & Woods, W. H. Coffman 1	*	1364
RUSH COUNTY—		
Arlington Natural Gas Co., Delbert Winkler 1	¶	885
Bert Reed, Bert Reed 1	*	885
SPENCER COUNTY—		
Ed Lorch, Ed Lorch 8	¶	651
VANDERBURGH COUNTY—		
John L. Drake, Jno. Effinger 9-W	20	897
Vanderburgh Oil Corp., Geo. W. Hornby 7-38A	3	898
VIGO COUNTY—		
Carter Oil Co., H. Harden et al 1	20	2170
G. W. Roy et al 1	20	2164
Riley Development Co., Talley 1	4	....
Pierson & Yaw, Theo. Hulman Est. 1	*	2126
WARRICK COUNTY—		
Imperial Oil & Gas Products Co., Mabeth Mining Co. 1	*	1530

*Failures: †Junked; ¶Million cu. ft. gas.

MICHIGAN FIELDS

State's largest unit project started by Sun and Mammoth

Mt. Pleasant, Mich.—Mammoth Producing & Refining Corporation and the Sun Oil Company have purchased in fee a 1250-acre block in Secord Township, 19n-1e, Gladwin County, and have started immediate development on a unitized plan to represent the biggest deal of this kind in the state's history. The block includes all of Section 3, the south quarter of Section 4, S½ NW of 4, the E½ NE of 4, NW of 10 and the NW NE of 10.

Daily Crude Oil Company this week moved in on the Mammoth-Sun Fee 1, NE SE NE, Section 10, a mile west of Whitehill-Bosley discovery well, as the first test of the block. Daily negotiated a deal for two 40-acre tracts on a farm out basis.

Mammoth and Sun purchased the property, with exploration and royalty rights, intact from the Edemville Power group and Frank Wixom, who owns thousands of acres in north central Michigan, originally bought for water power rights. The deal reportedly involved a cash settlement of more than $60,000. Mammoth and Sun this week finished negotiations for development of the block on a unitized program.

This is the first time that a major company has joined an independent in Michigan in developing a major block of acreage, recognized as semi-proven by virtue of the Whitehill well, which is producing from the Dundee formation about 60 barrels daily following acid treatment.

Sun Oil Company also is building rig for an east offset to the Whitehill discovery.

In Bentley Township, seven miles southeast of Buckeye, 17n-2e, Mammoth is building rig for a west offset to the Durham & Jones' extension test completed for 120 barrels daily in the Dundee horizon, while Bentley Oil Company is clearing location for an east offset. Gulf Refining Company this week moved in for a north offset to the Hand-Smart discovery well in Bentley.

Revenue from Michigan's 2 percent severance tax soared to a new all-time high during October, despite predictions that a 15-cent per barrel cut in the crude price would bring a reduction in tax collections, Melville B. McPherson, state tax commissioner reported last week.

October collections totaled $47,102 based on 1,814,661 barrels of oil valued at $2,240,402 and 861,566,300 cubic feet of natural gas valued at $114,717. This compares to collections of $25,198, based on 898,995 barrels of oil and 677,618,818 cubic feet of gas with a total valuation of $1,259,903, during the corresponding month of last year.

The previous high, registered during August, was topped by $1374. Severance tax money is divided on a 40-20-40 basis between state, county and township governments.

MICHIGAN Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Muskegon Oil Co.'s Nieker 2, nw se sw 16-4n-13w	70	1600
Ide Oil Co.'s Brenner 2, sw ne ne 17-14n-3w	*	1685
Earl Copley's Odell 1, nw nw sw 20-1n-13w	*	1420
ARENAC COUNTY—		
McClanahan Oil Co.'s Buffalo Land A1, se sw ne 20-19n-3e	*	735
GLADWIN COUNTY—		
Durham & Jone's LaFurgey 1, se sw ne 20-17n-2e	120	3546
Rowmor Corp.'s Manyet 2, se nw se 3-18n-1w	96	3650
Rex Oil Co.'s McKimmey 2, ne nw ne 13-18n-1w	110	3647
Bell & Mark's Armstrong 2, se se sw 23-18n-1w	150	3608
C. L. Maguire's Haven 3, nw sw sw 25-18n-1w	160	3610
Hubert Smith's Foster 3, ne nw se 26-18n-1w	200	3587
M. L. Jorgensen's Foster 2, se ne nw 26-18n-1w	200	3590
Dapar Oil Co.'s Villenuve 1, sw sw se 11-20n-2w	*	4165
ISABELLA COUNTY—		
McClanahan Oil Co.'s Terry 1, se nw se 32-18n-1w	216	3663
MIDLAND COUNTY—		
Pure Oils' Bond B3, c s½ ne se 12-13n-2w	70	3440
MONROE COUNTY—		
Milburn Violette's Russell 1, se sw se 5-6s-7e	*	2380
ROSCOMMON COUNTY—		
Franklin Pet. Co.'s St. Helen 1, se se sw 26-23n-2w	*	3740

*Failures; †Junked; ¶Million cu. ft. gas.

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This well is equipped with a 10-inch bore by 120-inch stroke Sullivan Pumphead, operating a 2¼" plunger set at 4,000-ft. String consists of 1,900-ft. ⅞" rods and 2,100-ft. ¾" rods.

The official records show a total of 136 hours of total downtime for all causes, out of a total of 12,432 hours operating time, less than 1.1 percent.

During most of this time, well was operated at 15-132 inch s.p.m., or at an average polished rod velocity of 330 feet per minute. This is equivalent to 36.6-54 inch s.p.m.

Well produced as high as 25,615 bbls. of fluid per month, or about 826 bbls. per day. And the cost per barrel was right in line with the average of this operator for the field.

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SULLIVAN PUMPHEADS

Shell exploiting old Yorba Linda with core holes.

* * *

Deep Santa Fe Springs test resumes at 11,310 feet.

* * *

North dome Kettleman Hills deep test disappointing.

Los Angeles.—Shell Oil Company, going back into the old Yorba Linda area in Orange County, has drilled five core holes, two of which showed production on the Yorba Land Company holdings. Core hole F, at 2313 feet, with 8⅝-inch cemented at 2191 feet, flowed 26 barrels of 18.1 gravity clean oil in one hour. It was then shut in. Core hole E was drliled to 2090 feet and flowed 75 barrels in eight hours, but mechanical troubles developed and it had to be abandoned.

Success of the Shell Oil Company in this old area of Orange County probably will mean a lot of new drilling in this section during the coming year.

Discovery of Yorba Linda in this area dates back 38 years, and in some instances wells around 35 years of age are stil pumping.

Getting Deeper Oil

In the old Rosecrans field in Los Angeles County, Barnsdall Oil Company is setting the pace for deep drilling. O'Dea 18 has been completed at 7595 feet for 1400 barrels of 33 gravity clean oil, in addition to 850,000 cubic feet of gas. Barnsdall has staked location for O'Dea 19, 202 feet north and 640 feet east from the center line of Broadway and Rosecrans avenue, in Section 18-3-13.

Oil from Rosecrans is very desirable and the present daily average production for the field is only slightly better than 4200 barrels.

Union Oil Company, after a lot of mechanical trouble, is drilling at 11,310 feet in sand and shale in Bell 100, Santa Fe Springs deep test. The hole has 10,217 feet of 6⅝-inch cemented. It is understood the well will be drilled to production or as deep as possible. Practically every producer in Santa Fe Springs is waiting to see what the Union well will uncover.

Union Oil Company also is taking the lead in drilling for deeper production in the old Richfield field in Orange County. Present production is coming from the Chapman and Kreamer zones at 3700 and 4600 feet, respectively. Union's Chapman 29 is now drilling at 9041 feet, coring all the way. The cores are showing hard sand and streaks of shale.

New Company in Chino

In the Chino area of San Bernardino County, Selegna Drilling & Producing Company has taken over all the leases and former holdings of Western Gulf Oil Company and will start a new test at once. Western Gulf drilled two small producers on the Abacherli property several years ago, but the production was not profitable. The new company is to drill its first test about 700 feet from Western Gulf's No. 2, in Section 12-3s-8w.

In the Wilmington field near Long Beach in Los Angeles County, no completions were reported for the past week, but a check indicates operations will be fairly lively in the coming months. There are 27 drilling wells in Wilmington, in addition to 21 rigs up and 25 locations staked.

It is understood only three holes will be started at once in the new Harbor area, which is so closely controlled by Long Beach authorities. These new holes will be drilled in widely seperated areas.

Wells in Wilmington are producing slightly better than 60,000 barrels a day, but sand troubles have developed in the older wells and the others are not holding up as well as had been expected. Independent refiners are still hauling away a lot of this oil in tank trucks, mostly at prices slightly under the present posted price.

A test of Superior Oil Company's Huffman 5, Avenal deep test for the north dome of Kettleman Hills, was a disappointment, since only gassy mud was recovered from formation between 10,058 feet and 10,301 feet. The formation was very hard and tight.

Kettleman North Dome Association's No. 4-18J, with bottom at 11,746 feet, is still fishing for stuck drill pipe. Last casing in this hole was 6⅝-inch cemented at 10,715 feet.

In the Middle Dome of Kettleman Hills, Temblor Oil Company's Bunting 1, in Section 25-23-18, with bottom at 9100 feet, ran electrical test, and it was indicated that last 1000 feet of the hole would warrant a test. Liner is being run. The Temblor formation was encountered twice, first at 8092 feet and again at 8918 feet. A string of 6⅝-inch was landed at 8050 feet and a production test is scheduled in about one week.

In the Gaviota area of Santa Barbara County, Wilshire Oil Company is preparing to drill a wildcat on the 1000-acre Hollister lease. Hollister 1 is 660 feet north and 2705 feet east from the southwest corner of Section 35-5-33, or north and west of the recently completed Gaviota Oil Company's Hollister 1, a gas well which is shut in.

Plugs Back and Flows

Failing to find a deeper oil producing zone below the eight oil sands at Dominguez, Union Oil Company plugged Callender 56, northwest outpost test, from 9620 feet to 7300 feet, and it started flowing at 1680 barrel rate. No formation below the eighth zone indicated anything of importance.

Union Oil Company's Oil Operators 3, northwest extension of Long Beach field, has been completed at 4076 feet for 365 barrels of 24 gravity clean oil, accompanied by 300,000 cubic feet of gas.

In the Ten Section area of Kern County, Shell Oil Company's No. A-8-28, outpost test, SWc Section 28-30-26, is being abandoned with bottom at 8860 feet in gray sand.

CALIFORNIA Completions

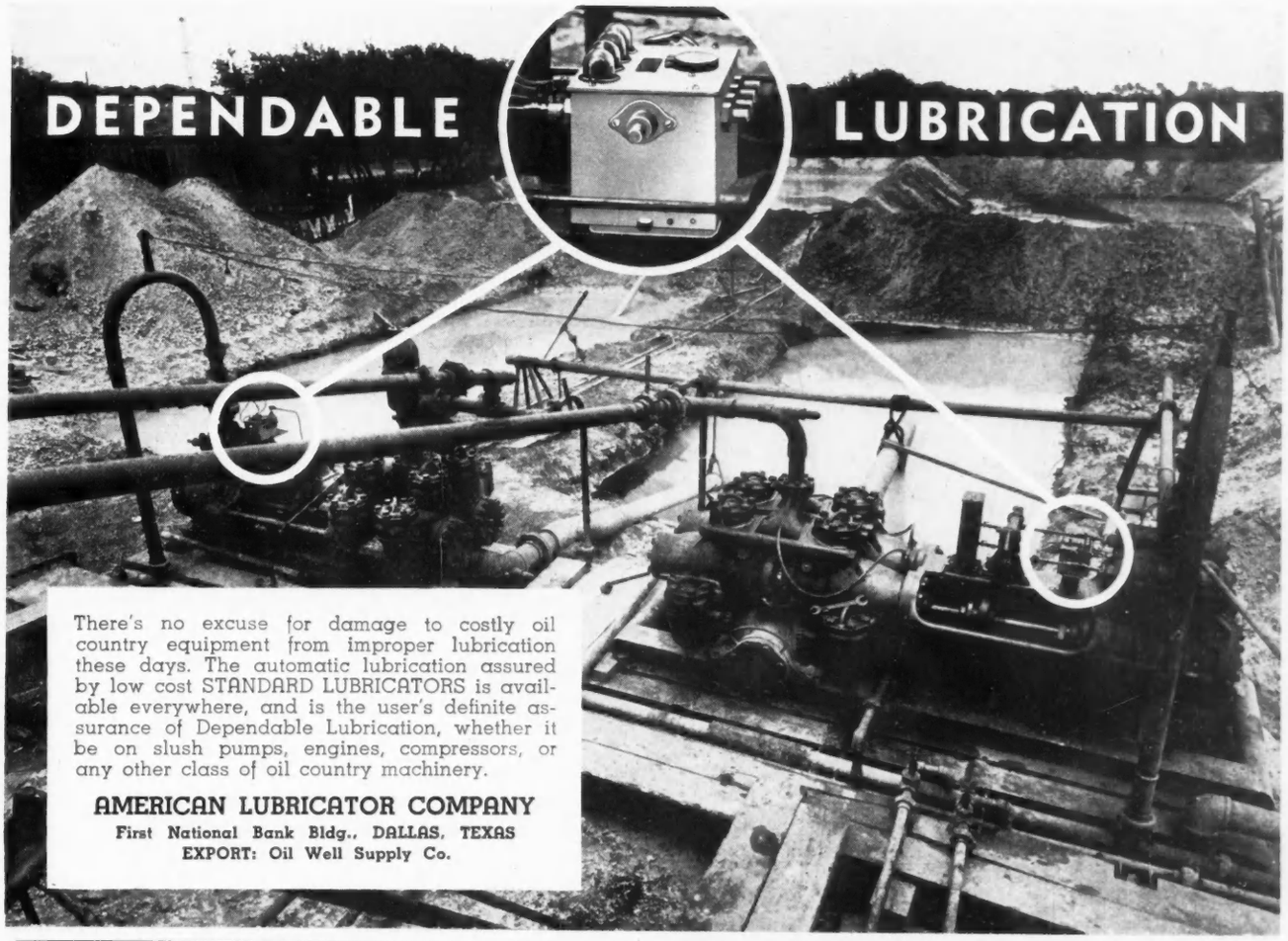
Company, Well and Location	Init. Prod. Bbls.	Depth
VENTURA AVENUE—		
Tide Water Associated, Hartman 27	65	6570
PADRE CANYON—		
Continental, Hobson 4	165	6028
EDISON—		
Westbrook Oil Co., Westbrook 1	75	3560
FRUITVALE—		
Gulf, K.C.L. B-29	290	3035
MIDWAY-SUNSET—		
U. S. Pumping & Equip. Co., No. 2	50	1749
MOUNTAIN VIEW—		
Vesta Pet. Co., Vesta 12	80	5100
ROUND MOUNTAIN—		
H. A. McDonald, Bell 1	380	1886
Marcan Oil Co., No. 1	450	1947
SANTA MARIA VALLEY—		
Geo. F. Getty, Vicente 1	1200	4494
Pacific Western, Samarin 1	2140	4837
Union, LeRoy 2	300	5334
Russell 3	325	4439
KERN COUNTY—		
Freemont Oil Co., Olcese 2	*	2813
Paul F. Travis, Giffin 1	*	1435
SAN MIGUELITO—		
Continental, Grubb 8	†	3937
EL SEGUNDO—		
Apex Pet. Co., Elsie Com. 1	1335	7103
Ohio, Gough 9	430	7320
Ruchti Pet. Co., No. 4	475	7099
Tide Water Associated, Leuzinger 1	*	8009
LONG BEACH—		
Richfield, McKeon 4	75	4400
Texas Co., Harlow-Kent 14	120	4650
ROSECRANS—		
Barnsdall, O'Dea 18	1400	7595
RICHFIELD—		
Union, Chapman 46	165	4400

*Failures; †Junked; ¶Million cu. ft. gas.

California board starts accident reduction campaign

Los Angeles.—With the recent appointment of A. J. Martinson, formerly of the safety department of Union Oil Company, as director, the California Petroleum Safety Board actively starts its campaign to reduce accidents in the oil industry.

The newly formed accident prevention group is headed by Frank A. Travers of the South Basin Oil Company as president. Other officers of the board are: L. L. Aubert, Bankline Oil Company, and A. B. Jenks, Fullerton Oil Company, vice presidents; R. W. Metcalf, Signal Oil & Gas Company, treasurer; Paul Stanley, Barnsdall Oil Company, secretary; C. E. Taber, Seaboard Oil Corporation, assistant secretary and treasurer.



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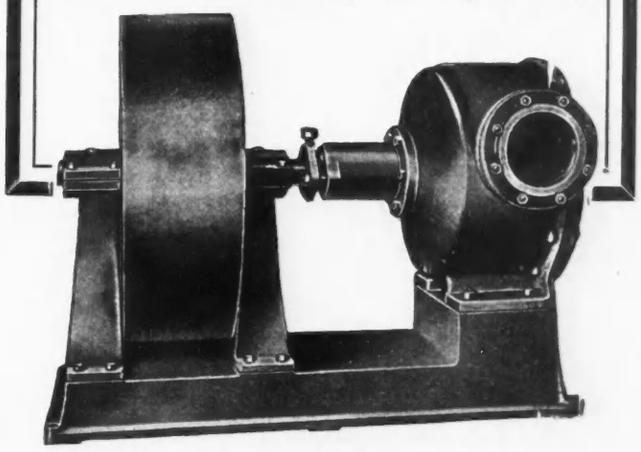
P. O. BOX 2811 **HOUSTON, TEXAS**

The VIKING

General Purpose Rotary Gear Type Pump



Capacity: 1,050 gallons per minute.
Standard 8-inch belt driven.

Distributed by

Southern Engine & Pump Company
HOUSTON, DALLAS AND KILGORE, TEXAS

IMPORTANT WILDCAT TESTS

ALABAMA

GREENE COUNTY—Greene County Dev. Co.'s R. C. Lett 2, se nw 5-21n-2e, sd 115 ft.

HOUSTON COUNTY — Rice O&G Co.'s Oakley Est. 2, se nw sw 9-3n-29e, arr set 7-in csg, td 4975 ft, Tuscaloosa.

MOBILE COUNTY—J. C. Prine's King 2, ne ne 4-1n-4w, elev 135 ft, 10-in csg 300 ft, arr deepen 1100 ft (1100 ft s of No. 1). Grand Bayou O&G Co.'s J. A. Stafford 1, sw sw 24-7s-3w, lcn.

ARKANSAS

CLARK COUNTY—M. M. Martin's Cabe 1, nw nw 14-10-20, dr 2410 ft red shale.

COLUMBIA COUNTY—Tidewater & Seaboard's Crumpler 1, nec sw 24-17-19, elev 282 ft, top lower Travis Peak 5420 ft, top lower red beds 7115 ft, top anhydrite 7500 ft, mo csg, td 7568 ft.

CRITTENDEN COUNTY—Manning & Martin's Cartright 1, se nw sw 16-7n-8e, mim.

DREW COUNTY—Sloan Wells et al's Hardy 1, sec nw 3-14-7, rur.

HEMPSTEAD COUNTY—Easton, May & Murdock's R. M. LaGrone 1, ne ne 5-12-26, sdtr, td 2944 ft.

LONOKE COUNTY—J. E. Russell's Gunter 1, se se 17-5-10, so 503-8 ft, repr rig 508 ft. Frank Silver's Chambers Est. 2, sw ne sw 17-2-7, wo 1500 ft.

MILLER COUNTY—F. W. Burford's August 1, 8-20-27, completed at pb depth 6165 ft, 40 bbls daily, old td 6230 ft. F. F. Earles' General American 1, se se sw 20-14-26, rur. Hearell & Burnett's Willie Wallace 1, se nw se 7-20-27, lcn.

NEVADA COUNTY—W. E. Lokey, Tr.'s Purifoy 1, 17-11-20, junked 2220 ft.

OUACHITA COUNTY — Copenhaver Oil Corp.'s Evans 1, ne sw 20-11-19, sd 1730 ft. O. F. Whittaker's C. C. Guttry 1, se sw se sw 21-15-19, completed pumping seven bbls oil daily, td 2180 ft; C. C. Guttry 2, se nw 21-15-19, spd coring 2112 ft.

UNION COUNTY — W. D. Wingfield's Southern Kraft 2, sw ne 18-16-14, 7-in csg 2721 ft, abn 2728 ft.

CALIFORNIA

FRESNO COUNTY

DOS PALOS—Bergman Oil Co.'s Ora Loma 1, 12-12-11, sd 6006 ft.

CLOVIS—Central Valley Oil Co.'s No. 1, 1-12-20, dr shale 300 ft.

JACALITOS CREEK—Dauphin Dev. Co.'s Boone 1, 20-21-14, dr shale 2826 ft.

PANOCHE—J. A. Gauthier's Hubbard 1, 12-14-11, td 510 ft, rigging heavier equipment.

JACALITOS HILLS — Jacalitos Pet. Co.'s Associated 1, 14-21-15, testing 5201 ft.

HURON—Pure's S.P. 1, 31-18-17, dr shale 8763 ft.

CIERVO—Superior's No. 1, 20-16-13, rigged up.

KERN COUNTY

DEVIL'S DEN—Amerada's Beer 5, 22-26-19, dr 5041 ft.

MIDWAY-SUNSET—American Empire Oil Co.'s No. 1, 20-31-24, rur.

WASCO—Continental's K.C.L. A-2, 9-27-24, dr 11,578 ft.

ROSEDALE—Continental's K.C.L. B-1, 12-29-26, td 10,205 ft, redr 8166 ft.

ROUND MOUNTAIN—Crestmont Oil Co.'s Staley 1, 8-28-29, dr 1022 ft. Freemont Oil Co.'s Olcese 2, 35-28-29, abn 2813 ft. Shell's Olcese-Lilly 2, 21-28-29, lcn. D. G. Vedder's Bell 1, 12-28-28, td 1978 ft, pumping 348 bbls 15 gravity oil.

ARVIN—General's Houchin 1, 27-31-29, td 7928 ft, perforated 7380 to 7405 ft, swabbed gas and mud to further test; Pauley 1, 22-31-29, dr sand 465 ft. Petrex Inc.'s No. 1, 32-31-30, dr shale 1705 ft.

BELRIDGE—General's St. Helens 1, 12-28-20, dr shale 4822 ft.

GRAPEVINE—Honolulu Oil Corp.'s Honolulu-Associated 33-1, 33-12-19, dr shale 4020 ft. Ohio's T.R.C. D-2, 23-11-19, dr shale 3475 ft.

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*	owdd—*old well drilling deeper*
‡—*salt water (completions).*	owpb—*old well plugging back.*
†—*junked and abandoned.*	pb—*plugged back or plugging back.*
¶—*million feet of gas.*	r—*reaming.*
abd—*abondoned.*	rog—*rig on the ground.*
bbls—*barrels.*	rur—*rigging up rotary tools.*
br—*building rig.*	rust—*rigging up standard tools.*
b.s.—*basic sediment.*	sd—*shut down.*
csg—*casing.*	sdtr—*sidetracking.*
co—*cleaning out.*	sg—*show gas.*
dd—*drilling deeper.*	si—*shut in.*
dk—*derrick.*	so—*show oil.*
dr—*drilling.*	so&g—*show oil and gas.*
fsg—*fishing.*	spd—*spudding.*
ft—*feet.*	sr—*straight reaming.*
hfw—*hole full of water.*	sw—*salt water.*
in—*inches.*	td—*total depth.*
lcn—*location.*	ur—*underreaming.*
m—*milling.*	wih—*water in the hole.*
mim—*moving in materials.*	wo—*workover.*
mit—*moving in tools.*	wocs—*waiting on cement to set.*
mot—*milling on tools.*	wosr—*waiting on standard rig.*
n, s, e, w—*north, south, east, west.*	
oih—*oil in hole.*	

Universal Cons. Oil Co.'s Tejon 1, 33-11-19, dr brown shale 4060 ft.

McKITTRICK—Par-Mer Oil Co.'s Par-Mer 1, 6-31-22, dr shale 1950 ft.

MOUNTAIN VIEW—Section Six Oil Co.'s Johnston 1, 6-31-29, dr shale 7019 ft.

STRAND—Shell's K.C.L. A-72, 14-30-25, td 1950 ft in shale wocs 11¾ in 1023 ft.

SAN EMIDIO—Shell's No. 4-26, 26-11-22, rig.

TEN SECTION—Standard's K.C.L. 15-1, 27-30-26, dr shale 7880 ft.

SEMITROPIC—Standard's Randolph 2, 14-27-23, dr shale thin streaks oil sand 7930 ft.

McGUNDEN—Standard's Routzong 1, 2-30-28, dr shale and gray sand 5470 ft.

MOUNT POSO—Summit Oil Co.'s Glide 1, 31-27-28, dr shale 2376 ft. Paul F. Travis' Giffin 1, 10-27-28, abn 1435 ft.

GREELEY AREA—Superior's K.C.L. 9, 3-30-26, td 7870 ft, wocs 7 in, 7870 ft.

SOUTH MARICOPA—Texas Co's Pioneer 1, 33-11-23, dr 5360 ft.

MISCELLANEOUS

GLENN COUNTY—Ohio's Willard 1, 18-20-2, td 1957 ft, test showed salt water.

HUMBOLDT COUNTY—Texas Co.'s Eureka 2, 22-3-1, td 7708 ft, plug 5737 ft, flowing 1,052,000 ft gas.

MERCED COUNTY—Amerada's Carano 1, 19-10-11, dr shale 6266 ft.

SAN JOAQUIN COUNTY—Standard's Weil-Zuckerman 2, 25-2-4, td 6530 ft, in sand, tested salt water.

SAN MATEO COUNTY—Wilshire Oil Co.'s Cowell 1, 20-6-5, dr shale 4760 ft.

SOLANO COUNTY—Tracy Dr. Co.'s Hanson 2, 36-4-2, rur.

SUTTER COUNTY—Buttes Oilfields' No. 2, 2-15-1, td 6051 ft, to test.

TULARE COUNTY—Standard's Morris 1, 36-24,28, dr 10,626 ft. J. F. Wilcox's Sears 1, 29-24-28, r, td 892 ft.

MONTEREY COUNTY — Amil A. Anderson's Hillman 1, 15-24-14, dr shale 2925 ft. Elba Oil Co.'s Elba No. 2, rig.

SAN LUIS OBISPO COUNTY—Ajax Pet. Co.'s No. 1, 27-26-13, rig. Cholame Syn.'s Jack 2, 10-25-15, td 3641 ft, co. Little Cuyama Oil Co.'s No. 1, 3-10-26, dr shale 3476 ft.

SANTA BARBARA COUNTY—E. C. Arnold's Arnold-Apache 2, 8-8-33, co 6370 ft. Carpinteria Oil Co.'s No. 1, 34-4-2, rur. O. C. Field's Santa Rita 1, 11-7-33, td 3358 ft, to deepen. Standard's Las Flores Land 1, 27-9-33, dr shale 1726 ft. Wilshire Oil Co.'s Hollister 1, 35-5-33, rig.

VENTURA COUNTY—Southern Calif. Dr. Co.'s U.P.D. 2, 26-2-21, dr volcanics 2788 ft, gas show at 2600 ft. Vaca Oil Explor. Co.'s Lennox 1, 6-1-21, dr shale 2760 ft. Richfield's McFarland 1, 13-2-21, dr 5620 ft. Texas Co.'s Rancho Santa Clara del Norte 1, dr 3076 ft. Yale Richardson 1, 13-3-21, grading.

SOUTHERN CALIFORNIA

WILMINGTON AREA—Alford Dev. Co.'s Class. Yards 3, 22-4-13, dr shale 4165 ft.

NEWHALL — Barnsdall's Rancho S.F. 2, 26-4-17, dt 5145 ft, making new hole. West Coast Dev. Corp.'s Newhall Land 1, 27-4-16, rur.

PICO CANYON—Downey Oil Corp.'s No. 1, 36-4-17, td 2452 ft, rep equip.

PALOS VERDES—Hunter-Devlin & Associates' No. 1, 17-4-13, td 5502 ft, to test open hole.

WALNUT—Julian & Criswell's Langstaff 1, 5-2-9, fsh 2855 ft.

TICK CANYON—Mint Canyon Pet. Co.'s Jennings 1, 35-5-14, dr 550 ft.

MONTEREY PARK—W. E. Ramsey and Monte Cristo Pet. Co.'s Garvey 1, 27-1-12, dr.

PALOS VERDES HILLS—Roling Hills Pet. Co.'s P.V. 1, 27-4-14, dr 1156 ft.

CASTIAC — Royal Lands Corp.'s Ramona Hills 1, 8-4-17, dr 120 ft.

GARDENA—Texas Co.'s Gardena Com. 5-1, 30-3-13, dr 3350 ft.

ORANGE COUNTY—Shell's Harbeson 1, 9-4-10, dr gray sand 8116 ft; Olinda Land Co. E, 16-3-9, core hole, td 2090 ft, flowed 75 bbls in 8 hours, hole junked; Olinda Land F, 16-3-9, core hole, td 2460 ft, plug 2313 ft, flowed 26 bbls 18.1 gravity oil in an hour, shut in.

SAN BERNARDINO COUNTY — Selegna Dr. & Prod. Co.'s Abacherli 3, 12-3-8, (near Chino), dr.

FLORIDA

LAKE COUNTY—Oil Dev. Co. of Fla.'s Gulf Expl. Co. 2, se se 17-24s-25e, elev 120 ft, arr set pckr and retest at 2600 ft, old td 6126 ft.

LEVY COUNTY—Fla. Oil Discovery Co.'s Sholtz 2, sw sw ne 9-15s-13e, dr 1920 ft, dark brown granular limestone.

NASSAU COUNTY—St. Mary's River Oil Corp.'s Hilliard Turpentine Co. 1, nw ne se 19-4n-24e, elev 110 ft, installing new drilling line, td 3810 ft, shell and gumbo.

SUWANEE COUNTY—Wm. G. Blanchard's Lucy Cotton 1, se ne 35-3s-11e, elev 70 ft, resetting 16-in csg at 190 ft, to eliminate caving hole.

KANSAS

BARBER COUNTY—Olson and Skelly's Elsea 1, sw se nw 27-32s-14w, abn 4844 ft. Kansas Oil Corp.'s Mease 1, ne se se 27-30s-11w, set 7-in csg 4438 ft, rust. Helmerich & Payne's Winter 1, nw nw sw 16-32s-10w, rot rig.

BARTON COUNTY—C. L. Price et al's Hammeke 1, ne ne sw 12-18s-12w, bailing. Arch Merriam et al's Norris 1, ne ne nw 33-17s-11w, abd 3354 ft. Martin & Foraker et al's Dick 1, ne sw sw 31-19s-11w, mim. Shell's Ehrlich 1, sw sw sw 1-16s-14w, dd to 3296 ft, 2800 ft oih. Stanolind's Hagen "A" 1, se se se 21-20s-11w, abd 3333 ft. Ash et al's Frees 1, nw nw nw 34-16s-11w, dr 440 ft. Shell's Eckart 1, se se sw 13-16s-14w, rur. Lauck & Moncrief and Vernon O&G Co.'s Rodenburg 1, ne se sw 6-17s-12w, woc 360 ft. Thayer Drlg. and Brouk's Soderstrom 1, se se nw 21-17s-13w, ru.

CHAUTAUQUA COUNTY—C. L. Brosius et al's Garrett 1, nw sw nw 26-32s-11e, abd 1545 ft. Buffington's Fisher 1, cwl sw nw 10-34s-9e, td 1679 ft, est 25 bbls oil per day, comp. I. W. Siegle's Temple 1, sw sw sw 31-32s-12e, dr 400 ft. Sooby et al's Davis 1, sw ne nw 29-33s-10e, td 1019 ft, making 1 bbl oil per day. Ingot Oil Co.'s McKee 1, sw se sw 21-32s-12e, p. 2 bbls oil & 2 bbls wtr per day, comp.

CLARK COUNTY—Olson et al's Watkins 1, sw sw nw 23-32s-21w, cor 5265 ft; Lehman 1, se se sw 20-32s-21w, dr 2315 ft.

COWLEY COUNTY—Pryor & Lockhart's Brown 1, ne se se 34-33s-3e, co 3403 ft. Earl Wakefield's Whitson 1, sw ne se 8-32s-4e, co 1570 ft. Arthur Brewer Co.'s Shepherd 1, ne ne sw 20-32s-4e, dr 2880 ft. Murta-Wilson et al's Stuber 1, se ne ne 27-30s-5e, ur 8-in csg 2110 ft. Dickey Oil Co.'s Kansas G & E Co. 1, ne ne ne 22-34s-3e, dr 2040 ft.

ELLIS COUNTY—P. G. Reynolds et al's Karlin 1, nw nw nw 13-12s-18w, ur 6-in csg 3545 ft. Colonial Oil Co. and Bernheimer's Allbert 1, sw sw ne 13-12s-18w, co 3390 ft. Glimac Oil Co. et al's K. C. Life 1, se sw nw 5-11s-18w, rig. Colonial Oil Co.'s Hadley 1, se ne se 5-11s-18w, lcn. Bradley Oil Co.'s Jensen 1, nw nw se 36-11s-19w, dr 3415 ft. C. L. Carlock's Heyle 1, se se nw 14-13s-16w, spd. Continental's Baumrucker 1, ne ne sw 25-14s-16w, dr 1810 ft. Helmerich & Payne et al's Stebbins 1, nw nw se 7-13s-20w, dr 2860 ft. Watchorn O&G Co.'s Brown 1, ne ne se 34-13s-17w, dr 1390 ft.

ELLSWORTH COUNTY—Colonial Oil Co.'s Hogy 1, nw nw sw 16-16s-10w, ru. Hinkle et

al's Andrea 1, ne ne se 17-17s-10w, dr 1790 ft. Ralph Wixon et al's Peterman 1, sw sw sw 28-17s-10w, ru.

FORD COUNTY—Olson et al's Fowler 1, c sw¼ 26-27s-22w, dr 5745 ft.

GRAY COUNTY—P. G. Reynolds' Watkins 1, c sw 32-28s-28w, rig.

GREENWOOD COUNTY—Eagle Oil Co.'s Stine 1, ne ne se 13-28s-10e, abd 740 ft. Whittaker & Johnson's Cannon 1, cel se nw 8-26s-13e, co 1185 ft. Chas. Reeser et al's Weide 1, nw nw se 18-25s-14e, abd 1556 ft.

HARVEY COUNTY—Allison & Fitzwilliams et al's Hawk 1, se sw ne 16-24s-1w, dr 2767 ft. Nat'l Ref. Co.'s Brown Bros. 1, nw se ne 22-23s-2w, rig.

JEWELL COUNTY—Hollingsworth Bros.' Wolfe 1, nw sw se 14-4s-8w, ru.

MARION COUNTY—Tom Palmer et al's Matz 1, sw sw se 8-19s-1e, dr 2760 ft.

McPHERSON COUNTY—C. E. Ash Drlg. Co.'s Broman 1, ne ne nw 19-17s-4w, abd 3730 ft. Dole-Park Dev. Co.'s Doles 1, ne nw ne 12-19s-1w, est 1,000,000 cf gas & hfo in 36 hrs, no test. Clyde Pulse et al's Boesker 1, se se nw 29-20s-1w, rig. Boyle & Grossman's Diener 1, se se ne 35-19s-1w, dr 2755 ft. Carter's Hoglund 1, c w½ sw nw 8-17s-3w, dr 2405 ft. Phillips' Galle 1, nw nw ne 11-21s-2w, dr 2610 ft. Archer & Crane's Templin 1, nw sw se 32-17s-3w, cel.

NESS COUNTY—Jones & Lane's Page Milling Co. 1, se se nw 36-18s-26w, fsg 3265 ft. Trojan O&G Co.'s Moses 1, c sw nw 10-18s-25w, co 500 ft. Continental Oil Co.'s Olson 1, sw nw nw 5-18s-25w, dr 2500 ft.

PAWNEE COUNTY—Stanolind and Amerada's Jantz 1, sw sw sw 25-20s-16w, made 1½ bbls oil per hr, td 3822 ft. Phillips' F. A. Johnson 1, c ne sw 8-20s-19w, fsg 3883 ft.

PRATT COUNTY—Skelly et al's Adams 1, se nw ne 2-28s-11w, set whpstk 4223-53 ft, woc. Pem Drlg. Co. et al's Holland 1, sw nw se 6-26s-12w, abd 4340 ft. Helmerich & Payne et al's Hoeme 1, se se ne 20-26s-12w, brr.

RENO COUNTY—Sam Schneider et al's Kroecker 1, ne ne ne 12-22s-5w, dr 3830 ft. Carey et al's McPheeters 1, ne ne nw 22-26s-8w, co 408 ft. W. E. Witt et al's Fair 1, nw se se 4-22s-8w, td 3344 ft, est 500,000 cf gas & flo 5 to 10 bbls oil per hr. Westgate-Greenland Oil Co. et al's Popp 1, sw sw ne 7-25s-4w, dr 3724 ft. Albert Austin's Schwiethold 1, sw sw ne 17-23s-10w, abd 3790 ft. McCole et al's Mathews 1, sw nw nw 15-24s-10w, cel.

RICE COUNTY—Fred Phillips et al's Oden 1, se ne nw 22-20s-7w, abd 3742 ft. Joe Aylward's Weihe 1, sw sw ne 23-18s-9w, ru.

ROOKS COUNTY—Graham et al's Fike 1, sw sw sw 9-9s-17w, fsg. C. R. Craft et al's Ziegler 1, ne ne sw 8-10s-16w, ur 6-in csg 3495 ft. Texas Co.'s McCarroll 1, cwl nw 29-10s-17w, abd 4193 ft. Colonial et al's Tucker 1, sw se nw 23-10s-17w, rur. Producers Oil Co.'s Tucker 1, sw se nw 23-10s-17w, dr 2725 ft. Ross Oil et al's Hancock 1, ne ne nw 5-10s-17w, dr 1390 ft. Witt & Sheridan et al's Morrison 1, nw se sw 29-10s-17w, brr. Elwell et al's Insurance Co. 1, ne ne nw 15-9s-18w, lcn.

RUSH COUNTY — Wakefield & Brouk's Kerbs 1, nw nw se 11-17s-16w, fsg 2445 ft.

RUSSELL COUNTY — Murfin & Vernon O&G Co.'s Pearson 1, ne ne ne 31-15s-15w, dr 2885 ft. C. L. Price's Sebesta 1, ne ne ne 36-15s-11w, abd 3435 ft. Jones & Shelbourne's Short 1, ne ne ne 12-15s-12w, fsg 1700 ft. Phil-Han & Hinkle's Reinhardt 1, se se sw 19-14s-14w, dr 1020 ft. Sheilds et al's Rogg 1, nw nw sw 28-14s-13w, mim. Parks et al's Gorham Estate 1, sw nw ne 19-15s-15w, rig.

SEDGWICK COUNTY—Nat'l Ref. Co.'s Fee 1, se ne se 36-27s-2e, pb 3098 ft, P. Pot. 189 bbls oil & no wtr, comp. I. W. Murfin et al's Martin 1, se se nw 18-28s-1e, swb 45 bbls oil, 24 hrs. W. C. Talbott et al's Downs Estate 1, se se nw 32-28s-2e, testing. Steinbuchel's Shaffer 1, sw sw nw 18-25s-1e, dr 3260 ft.

STAFFORD COUNTY—Hinkle et al's Moses 1, nw nw sw 9-22s-13w, dr 3175 ft. Stanolind's Tiechman 1, se se se 13-22s-13w, abd. Torry & Feaster et al's McConnaughay 1, ne se nw 8-24s-13w, abd 4155 ft; Heggy 1, ne ne sw 26-23s-11w, rur. Stanolind's Wadsack 1, sw sw ne 4-25s-11w, dr 2950 ft. Torry & Feaster et al's Negley 1, sw sw ne 23-22s-12w, dr 682 ft. Lindsay & Bailiere et al's Tiepermann 1, sw sw nw 31-22s-12w, dr 2860 ft. Winemiller et al's Sittner 1, sw sw sw 4-22s-12w, mim. Rust et al's Sims 1, nw nw sw 8-23s-11w, mim.

SUMNER COUNTY — W. M. McKnab's Blair 1, sw sw sw 7-30s-1e, td 3869 ft, swabbing. R. J. Wixon's Newton 1, se se se 31-30s-2e, dr 3220 ft. Roth & Faurot's Fry 1, nw sw sw 8-31s-3e, dr 1150 ft. Hugh T. Jones et al's Stunkel 1, se se sw 2-30s-1w, rig. E. B. Shawver's Stewart 1, nw nw se 4-32s-3w, cel.

SOUTH LOUISIANA

ACADIA PARISH — Gulf's Broussard 1, Midland area, 49-10s-2w, dr shale 8971 ft. Humble's Sarver 1, South Crowley, 35-10s-1e, dr shale 10,210 ft.

CALCASIEU PARISH—D & D Oil Co.'s Lutcher Moore 2, 1-8s-13w, woc 8400 ft. Republic's Sabine Tram 1, 25-8s-14w, cutting and pulling 9670 ft. Union Sulphur's American Oil & Sulphur Co. 1, 16-10s-10w, dr shale 5470 ft.

CAMERON PARISH — Humble's Miami Corp. 1, 8-14s-5w, dr shale 9700 ft. Shell's Hanszen 1, 22-12s-6w, canal. Superior's State 1, in Gulf of Mexico, 4-15s-8w, setting 7⅝-in csg 7116 ft.

EAST BATON ROUGE PARISH—Cavalier's Elliott 1, 3-8s-2e, dr shale 7659 ft.

IBERIA PARISH—Texas Co.'s State 2-B, Vermilion Bay, 20-15s-6e, cutting and pulling 8971 ft.

JEFFERSON DAVIS PARISH—Continental's Fay 1, 31-10s-3w, dr shale 9348 ft. Humble's Stegall 1, 20-9s-5w, dr shale 7392 ft. Union Sulphur's Calcasieu National Bank 1, 12-9s-8w, woc 8524 ft.

LAFOURCHE PARISH — Amerada-L. L. E.'s South Coast 1, 34-15s-19e, dr shale 10,051 ft. Gulf's State PP 3, Timbalier Bay, 36-23s-21e, geophysical work 8728 ft.

ST. BERNARD PARISH—Gulf's State 2 RR, 38-14s-15e, dr shale 4590 ft.

ST. MARTIN PARISH—Shell's Frederick 1, 38-8s-5e, dr shale 6529 ft. Shell-Tide Water's Unit 1, 11-14s-12e, mim. Texas Co.'s St. Martin Land Co. 10, 15-8s-7e, dr shale 8892 ft.

ST. MARY PARISH—Shell's Barbour 1, 21-15s-12e, dr shale 9301 ft. Texas Co.'s State 1, 21-16s-12e, dr plug 10,920 ft.

TERREBONNE PARISH—Fohs and Delarge Oil Co.'s Buckley 1, 77-19s-17e, mim.

NORTH LOUISIANA

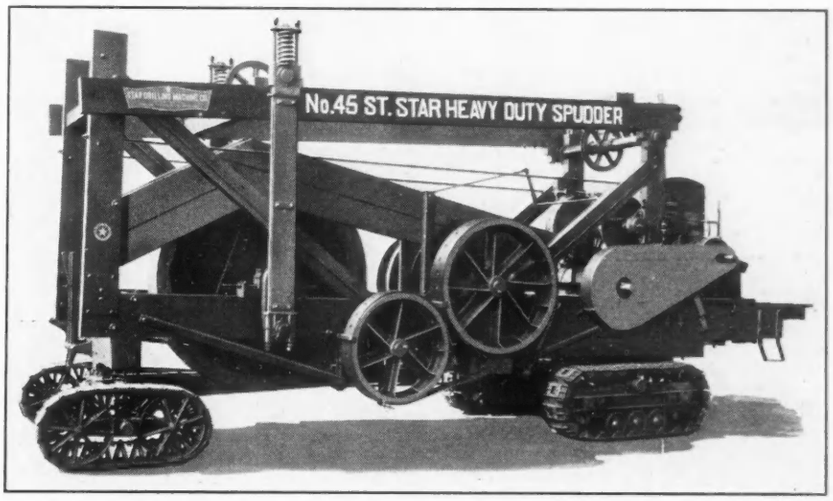
BIENVILLE PARISH—De Soto O&G Co.'s Ashley 2, c sw se 15-16n-10w, rur. Gulf's Goodpine 1, se sw 25-14n-8w, elev 157 ft, massive anhydrite 5303-5420 ft, coring 6015 ft black shale. Hunt & Seaboard's Federal Land Bank 1, c s½ 10-16n-6w, elev 296 ft, 7-in csg 6867 ft, dr 7645 ft (Travis Peak).

BOSSIER PARISH — Union Prod. Co.'s Kerr 1, c se 24-17n-12w, dr 3010 ft (lower Marine test).

CADDO PARISH—W. J. Hunter & Homer Hurley's Stoer 2, c se sw 10-15n-15w, rur. A. O. Olsen et al's Sharp 1, c w½ nw 15-18n-16w, elev 238 ft, tested some gas, arr acidize, td 5624 ft. Prairie River Synd.'s Hutchinson 1, sw nw 15-15n-12w, elev 153 ft, top lower Marine 8380 ft, top Bodcaw sand 8775 ft, tested sg 8987-9110 ft, arr deepen, td 9141 ft. A. D.

THE 45 ST STAR SPUDDER

COMBINES PORTABILITY WITH FULL PERFORMANCE ★ ★ ★



The No. 45ST Star Spudder is made to order for bad moving. With full crawler mounting it may be moved, completely assembled, under its own power. Tearing down, moving and rigging-up become a matter of hours instead of days. The No. 45ST Star may be used as conveniently under a standard derrick as with its own mast which is carried on the machine.

The 45 Star Spudder will do the *complete* job. Not only new drilling, but drilling-in after rotary, cleaning-out and deepening are all alike to the Star 45. With 4,000 feet capacity, chain-driven reels, plenty of power and a real drilling motion, the No. 45 Star Spudder will do this work quickly and economically.

Write for bulletin describing the various models of the Star 45, and other machines to The Star Drilling Machine Company, Akron, Ohio, or to one of these branches: Chanute, Kansas - Portland, Oregon - Abilene, Texas.

STAR DRILLING MACHINES

Robinson et al's Dickson 1, 22-20n-14w, elev 185 ft, top Nacatosh 870 ft, base chalk 1690 ft, dr 2000 ft.

CATAHOULA PARISH—G. E. Foster et al's Peck 1, c s½ 39-10n-8e, rur.

CLAIBORNE PARISH—J. B. Bond's Burgess 1, ne se ne 3-20n-5w, elev 276 ft, completed pumping 70 bbls oil day, pb, td 5325 ft, old td 5800 ft. W. L. McClanahan's J. T. Lewis 1, sw se 25-20n-7w, elev 400 ft, dr 5110 ft. Union Prod. Co. et al's Brownfield 2, c se nw 5-19n-5w, elev 235 ft, dr 8035 ft. Triangle Drlg. Co. et al's Hawks 1, 1-19n-6w, coring 5740 ft.

DE SOTO PARISH—Clear Lake Oil Co.'s Woolums 1, nw nw 29-12n-12w, cored sand so 2674 ft, wo 6⅝-in csg, td 2694 ft. Wright, Harris et al's (Kingston Oil Co.) Scott 1, ne ne 32-14n-13w, co caving hole, td 2778 ft. La. Seaboard's Lawrence 1, sw ne 36-12n-14w, dk.

LINCOLN PARISH—E. T. Oakes, H. D. Easton et al's N. L. Griggs 1, c sw 36-18n-1w, elev 199 ft, top anhydrite stringer 4253 ft, massive anhydrite 4493-4713 ft, cored oolitic lime sg 5173 to 5191 ft, cored 5314-26 ft oolitic lime oil stains, dr 5340 ft, dense oolitic lime.

RED RIVER PARISH—Ark. Fuel Oil Co.'s Franklin Realty Co. 1, c ne nw 20-11n-9w, elev 135 ft, top chalk 1350 ft, dr 4225 ft.

SABINE PARISH—Phillips & Fox's Cook Land Co. 1, sw se nw 1-9n-12w, elev 295 ft, cored sandy lime so 3320 ft, sd 3655 ft. Larry Romine's La. Long Leaf 1, c sw sw 7-5n-12w, elev 243 ft, Annona chalk 3598-3973 ft, Austin chalk 4820-4890 ft, top Georgetown lime 5010 ft, fsh, td 5290 ft, Georgetown lime. J. C. Sutton Oil Co.'s Sabine 1, se nw ne 23-7n-14w, rur (10,000 ft test).

TENSAS PARISH—H. M. Jones' Chicago Mill 2, c ne sw 31-12n-10e, spd dr 690 ft. Desha 1, c ne se 17-13n-11e, dk.

UNION PARISH—Joe Modisett et al's Frost 1, ne sw 14-21n-1e, elev 188 ft, top Travis Peak 4050 ft, 9⅝ in csg 4358 ft, dr 6368 ft black shale.

WEBSTER PARISH—Magnolia's Sexton 1, c sw ne 32-23n-9w, mim (9000 ft test).

MICHIGAN

ALLEGAN COUNTY—Robert Lentz's Hitzler 1, 34-4n-12w, sd 730 ft. Hughes Heinig's Lundburg 1, 29-3n-14w, lcn. S. B. Hood's Wright 1, 9-3n-13w, dr 1164 ft.

ARENAC COUNTY—R. L. Hill's Rhinehart 1, 25-20n-4e, driving 10-inch 140 ft. D. F. Jone's Sibley 1, 33-20n-7e, sd 2100 ft.

BAY COUNTY—Fortney Oil Co.'s Smart 1, 7-16n-5e, dr 2190 ft. Charles Weller's Dewyer 1, 20-16n-3e, dr Traverse lime 3046 ft. Gulf Refining Co.'s Martson 1, 1-14n-4e, driving 10-in 146 ft. Stork Oil Co.'s Century 1, 9-17n-3e, sd 3037 ft for 5-in csg, Dundee 3009 ft. Century Oil Co.'s Wilson 1, 27-17n-3e, dr 160 ft.

CASS COUNTY—Wayne Oil Co.'s Gebhard 1, 34-5s-15w, dr 1300 ft.

CLARE COUNTY—Sun Oil Co.'s Weldon 1, 14-19n-3w, dr 1410 ft. Wittmer Oil Co.'s Palomar 1, 2-18n-5w, hfw 4125 ft, co to set 5-inch casing for Monroe lime test. McClanahan Oil Co.'s Mortenson 1, 9-18n-5w, sd 1665 ft.

CRAWFORD COUNTY — Dome Oil Co.'s Lindgren 1, 33-25n-3w, dr 1500 ft.

GLADWIN COUNTY — McClanahan Oil Co.'s Connley 1, 35-17n-2e, dr 2900 ft. Rex Oil Co.'s Auer 1, 22-18n-2e, rig. Daily Crude Oil Co.'s Mammoth and Sun Fee 1, se se ne, 10-19n-1e, rig.

GRATIOT COUNTY — Turner Pet. Co.'s Wiley 1, 5-11n-3w, dr shale 3210 ft. Chartier Oil Co.'s Bolyard 1, 12-9n-4w, dr 2500 ft. Henry Kritzman's Nickert 1, ne nw se, 33-11n-4w, mim.

HURON COUNTY — L. D. Hendershot's Klamp 1, 1-17n-14e, sd 2029 ft. C. W. Teater's Martin 1, 15-15n-11e, r 8-inch 2300 ft.

ISABELLA COUNTY — J. Golden Zabel's Kennedy 1, 25-14n-4w, lost hole 1483 ft, rig skidded 90 ft, rigging up tools. J. V. Wicklund's Lawen 1, 24-15n-5w, rig. Rowmor & Cryden's Smith 1, 35-15n-5w, dr 1190 ft.

MACKINAC COUNTY—Charles Van Kuren's Hiawatha Club A-1, 27-44n-9w, dr 297 ft.

MECOSTA COUNTY—Sun Oil Co.'s Robart 1, 29-16n-7w, driving 10-in 651 ft. Frank Hebard's Weeks 1, 32-15n-7w, sd 476 ft.

MIDLAND COUNTY—Sun Oil Co.'s State B-1, 5-16n-1w, re-cemented 5-inch, waiting on acid to oil show in Dundee. Daily Crude Oil Co.'s State 1, 29-15n-2e, csd 6-in 1470 ft. Charles W. Teater's Hitsman 1, 13-14n-1w, sd 3690 ft.

OTSEGO COUNTY—Barton & Williams' Uill 1, 9-32n-3w, fsg 1080 ft.

ROSCOMMON COUNTY—Maynard Smith's Eggleston 1, 32-21n-2w, reaming 6-in 1250 to 1737 ft.

SAGINAW COUNTY — Darke Brothers' Rockwell 1, 5-11n-3e, fsg 358 ft. Hogan, Inc.'s Price 1, 2-11n-1e, dr 910 ft.

ST. CLAIR COUNTY—J. B. G. Co.'s Baldwin 2, 30-7n-17e, dr 100 ft.

SHIAWASSEE COUNTY—T. K. Buzard's McCullough 1, 12-6n-3e, dr 1435 ft in Berea sand.

WEXFORD COUNTY—G. H. Schrack's Fee 1, 17-22n-9w, rig.

MISSISSIPPI

BOLIVAR COUNTY—White & Jones' Ballou 1, ne ne 18-24n-7w, sd 1681 ft.

CALHOUN COUNTY—Ed Spencer's J. C. Conner 1, se ne 12-24n-8e, lcn. B. G. Dowell's H. D. Hughes 1, 18-23n-9e, sd 1600 ft.

CLAIBORNE COUNTY—Claiborne County Dev. Co.'s Ruth Hayden 1, s½ se 55-11n-2e, 10-in csg 200 ft, top Vicksburg 675 ft, dr 904 ft shale.

GEORGE COUNTY—Cleve Love et al's J. J. Newman Lbr. Co. 2, c sw 9-1s-8w, spd, arr set 10-in csg 1500 ft.

HINDS COUNTY—Black River Oil Co.'s Federal Land Bank 1, ne ne 11-15n-5w, spd. Cleve Love et al's S. F. Johnson 1, ne se 29-6n-1w, rur. Southern Nat. Gas Co.'s Angelo Williams 1, ne nw 35-6n-4w, elev 183 ft, 22-in csg 89 ft, 13⅜ in csg 416 ft, Jackson 170 to 750 ft, Minden 1280-1445 ft, Cane River 2010 to 2046 ft, top Wilcox 2631 ft, top cap rock 2730 ft, woc, td 2910 ft.

KEMPER COUNTY—R. A. Keaton et al's Buckwalter Lbr. Co. 1, nec 6-10n-14e, dk.

LAMAR COUNTY—Sun Oil Co. et al's Mrs. Kate Talley 4, se nw 33-4n-15w, dr 6650 ft. South Miss. Oil Co.'s Morris 1, sec 4-2n-14w, spd and sd.

PERRY COUNTY—Phillips Pet. Co.'s J. J. Newman Lbr. Co. 1, se se sw 21-2n-10w, elev 210 ft, 20-in csg 180 ft, 10¾ in csg 1532 ft, dr 2635 ft shale.

SIMPSON COUNTY—Goodwill O&G Co.'s Berry 1, 33-2n-4e, woc 10-in csg 60 ft, dr 270 ft sand.

WILKINSON COUNTY—A. B. Taylor et al's Foster Creek Lbr. Co. 2, nwc 32-4n-2w, (amended lcn), spd sd 75 ft for water.

YALABOUSHA COUNTY—Acme Holding Co.'s S. D. Boyle 1, nw nw 33-25n-7e, elev 285 ft, dr 205 ft (no recent report). Skuna Dev. Co.'s Mrs. T. A. Turner 1, se sw ne 25-25n-6e, sd 925 ft.

NEBRASKA

JEFFERSON COUNTY—L. R. Page et al's Bonham 1, c se se 31-1n-1e, dr 2810 ft.

RICHARDSON COUNTY—Arab Pet. Corp. et al's Ogle 1, se se se 9-1n-14e, td 3423 ft, pb to Viola lime.

OKLAHOMA

ADAIR COUNTY—B. L. Maddox's Penn Mutual 1, c s½ ne nw 5-16n-24e, dr 260 ft.

ATOKA COUNTY — C. M. Sheldon and Gardner Pet. Co.'s Lee 1, ne nw sw 2-4s-10e, 1721 ft.

BECKHAM COUNTY — Mid-American Oil Co.'s Biscoe 1-A, sw sw sw 28-8n-22w, dr 2228 ft.

BRYAN COUNTY — Southern Oil Co.'s Henry 1, c nw ne 10-8s-7e, der .

CADDO COUNTY—I.T.I.O. Co.'s Dome-Bo 1, c ne se 29-6n-10w, to core ahead.

CARTER COUNTY — Lloyd & Noble's Revelle 1, sw sw se 21-3s-2w, dr 3793 ft.

CIMMARON COUNTY — Hagey et al's Becker 1, c ne¼ 4-1n-3ecm, td 3010 ft, to pb.

CLEVELAND COUNTY—Harper & Turner's Pollock 1, c w½ nw nw 13-9n-2w, fsg 6850 ft.

CHOCTAW COUNTY—J. A. True's Boby 1, nw se nw nw 17-7s-19e, spd.

COAL COUNTY—Phillips' Beck 1, se sw sw 6-1n-9e, dr 5583 ft. Carter et al's Claytor 1, c w½ ne sw 27-2n-9e, dr 6585 ft.

COMANCHE COUNTY—J. W. Wolfe's Costinus 1, sw sw se 30-4n-11w, spd.

CREEK COUNTY—M. W. Mosier et al's Holcomb 1, se sw ne 19-18n-8e, td 3018 ft, dr out.

GARFIELD COUNTY—H. R. Hollenback et al's Clark 1, nw nw nw 34-21n-6w, dr 5626 ft.

GARVIN COUNTY—B. C. D. Edwards' Clark 1, ne ne ne 16-3n-3e, woc to perf.

GRADY COUNTY—Gulf's Thomas 1, sw nw nw 14-4n-5w, dr 9129 ft. Doyle Pet. Co.'s Huffine 1, nw nw se 30-5n-8w, dk.

GRANT COUNTY—Magnolia's Reynolds 1, ne ne se 19-25n-5w, coming out with core.

GREER COUNTY—J. I. Medlin et al's Broudie 1, nw nw nw 5-6n-20w, dr 1111 ft.

HUGHES COUNTY—Phillips' Becker 1, ne nw sw 8-5n-10e, dr 4588 ft. Pure's Rogers 1, se se ne 18-8n-12e, dr 4895 ft. Kenneth Ellison et al's Metro Life 1, c ne ne 14-7n-9e, spd.

JOHNSTON COUNTY — W. T. Shelton's Chapman 1, c nw nw 26-4s-6e, fsg 2510 ft.

KAY COUNTY—E. J. Shaffer et al's McKee 1, ne ne nw 20-28n-1w, dr 2486 ft, hfw. E. W. Jones et al's Dorse 1, se sw nw 25-26n-1w, dr 3543 ft. F. S. Freeland et al's Watson 1-A, ne nw nw 28-28n-1w, dgng cel & rog. E. J. Shaffer et al's Rudolph 1, ne ne sw 27-29n-1w, cel. Clark C. Nye's Willin 1, se se sw 24-27n-4e, c & p.

LINCOLN COUNTY—C. L. Carlock et al's Young 1, c n½ nw nw 23-15n-5e, to pb to Prue sand.

LOGAN COUNTY—Anthony & Marshall's Fruin-Eckman 1, se se sw 4-16n-1e, so&g, sd 5181 ft. Texas Co.'s Roper 1, c w½ sw se 22-15n-1e, td 5458 ft, to dr to 2nd Wilcox sand.

LOVE COUNTY—Sinclair Prairie's Peabody Seating Co. 1, ne ne ne 35-6s-2w, lcn.

MAJOR COUNTY—Ed Parsons' Patzkowsky 1, c nw¼ 10-20n-11w, rig.

MURRAY COUNTY—O. O. Owens' Bryer 1, ne se ne 34-1s-3e, dr 2575 ft.

MUSKOGEE COUNTY—F. E. Cusack's Elliott 1, cnl nw sw 20-15n-20e, rog. Cusack's Fee 1, ne sw se 20-15n-20e, spd 65 ft.

OKFUSKEE COUNTY—Mid-Continent's Inland 1, sw ne sw 10-13n-10e, rig.

OKMULGEE COUNTY—Phillips' Wood 1, nw sw sw 31-11n-13e, td 1415 ft, run 12½-in csg.

PAYNE COUNTY—Stanolind and Amerada's Bennett 1, nw se ne 31-19n-4e, dr 3580 ft. Mid-Continent et al's Ramsey 1, sw sw nw 18-18n-2e, spd.

PITTSBURG COUNTY — Okla Dist Oil Co.'s Beeler 1, ne ne sw 7-7n-14e, dr 6025 ft. Phillips' Gilcrease 1, nw nw se 16-7n-12e, dr 5745 ft.

PONTOTOC COUNTY — H. W. Lee's Weatherly 1, nw se nw 24-1n-7e, rig. Riddle et al's Fee 1, nw sw se 11-3n-5e, bldg rig.

POTTAWATOMIE COUNTY—Hightower's Bader 1, se se nw 27-6n-3e, rig abd.

SEMINOLE COUNTY—J. F. Root's Cone 1, nw ne sw 11-7n-5e, C & P. W. B. Osborn et al's Harris 1, nw nw nw 11-6n-5e, pb 2968 ft, to shoot. W. C. McBride's Jackson 1, ne ne sw 16-6n-7e, cor 1790 ft. H. V. Woodson and Marydun Oil Co.'s Gilliland 1, se se sw 24-11n-7e, dr 2215 ft.

STEPHENS COUNTY — Coline Oil Co.'s Johnson 1, sw se ne 1-2n-8w, ran 5-in liner, bailing 5500 ft. Ed Parsons et al's Blake 1, c sw nw 22-2n-8w, pb to 5020 ft, to pump. Clark & Cowden's Simpson 10, ne se ne 11-1n-5w, sd 6045 ft, will dr to 6600 ft.

TEXAS COUNTY—Hagey et al's Peck 1, c ne¼ 6-1n-13ecm, set 7-in csg 2766 ft, woc.

EAST TEXAS BORDER COUNTIES

CASS COUNTY — V. A. Hughes & Co.'s Lyster 1, Wm. Bateman sur, mim.

HARRISON COUNTY—Ark. F. O. Co.'s Abney 1, Eason Wilson sur, dr 3035 ft (Trinity test). Eastern Shrevetex Oil Co.'s George 1, J. S. Powell sur, wosr td 2505 ft.

PANOLA COUNTY—Danciger's Tatum 1, Alfred Bissell sur, abn 6514 ft. Magnolia's Hull 2, Thos. Applewhite sur, elev 222 ft, top Travis Peak 6024 ft, top lower Marine 8078 ft, pb to Travis Peak, tested dry at 6070 ft, pb to 5950 ft arr test again, old td 8718 ft. C. K. Crews' J. C. Graves 1, McGowan sur, dr 1350 ft.

SHELBY COUNTY—C. L. Cope's Pickering 1, Stephen English sur, rur. Portox Oil Co.'s Pickering 3, A. Hanson sur, rur. Redditt & Gray's Pickering 2, S. O. Pennington sur, rur. D. S. Ring's Windham 2, Jas. English sur, mim.

WEST TEXAS

(This report is confined to the north portion of the Permian basin).

ANDREWS COUNTY — Gulf's University 1-G, ne ne nw sec 8, blk 14, elev 3208 ft, top anhydrite 1700 ft, gas blowout in Yates sand 2997 ft, trace oil 4290-95 ft, sul water 4468-70 ft, dry and abd 4518 ft. Honolulu Oil Corp.'s J. E. Parker 1-6,ne ne new PSL sec 6, blk A-44, dr 2215 ft. Seaboard et al's Munger-Nix 1, c ne¼ PSL sec 1, blk A-41, lcn.

BAILEY COUNTY—Geo. Etz & E. H. Robertson's I. C. Enochs 1, c labor 66, blk 182, Floyd C. S. L. sur, elev 3788 ft, top lime 3173 ft, odor oil 3991-4021 ft, sd in sul water 4120-4137 ft.

BORDEN COUNTY—Continental's Clayton & Johnson 1-A, nwc of T&P Ry. sec 27, blk 32, T-4-N, elev 2534 ft, dr 2685 ft.

COCHRAN COUNTY—Devonian Oil Co.'s T. B. Duggan 1, nwc labor 11, league 55, Oldham C.S.L. sur, elev 3680 ft, top anhydrite 2160 ft, top Yates 2880 ft, top first lime 3820 ft, top solid lime 4180 ft, pay 4998-5044 ft, used 6500 gals acid, complete, flowed 251 bbls 30 gravity oil initial. M. S. Ingleright & E. E. Fogelson's N. H. Tarver 2, labor 14, league 55, lcn. J. R. Meeker et al's Mrs. D. Slaughter Wright 1, nwc sw¼ labor 26, league 96, Mills C.S.L. sur, rig.

FLOYD COUNTY—Mills Bennett's Montgomery 1, nec F. J. Latham sur No. 2, A-520, dr 2810 ft.

GAINES COUNTY—American Liberty Oil Co.'s W. N. Willard 1, swc of PSL sec 38,

blk AX, dr 4400 ft. Amerada's S. J. Averitt 1, c se ne of W. T. Ry. sec 228, blk G, elev 3323 ft, top anhydrite 1990 ft, used 1000 gals acid in lime 5016-35 ft, flowed 207 bbls initial 1-in choke. A. G. Carter et al's E. C. Brand 1, sec PSL sec 54, blk AX, lcn; E. C. Brand 2, nec se sec 54, elev 3576 ft, top anhydrite 2145 ft, used 1000 gals. acid in soft lime 4919-95 ft, tested 1700 ft sul water with trace oil; G. M. Langdon 1-A, nw nw ne PSL sec 43, blk AX, elev 3542 ft, used 9000 gals acid in lime 4908-4980 ft, flowed 775 bbls initial ¾-in choke. Continental's E. H. Jones 2, c se ne PSL sec 1, blk A-8, elev 3632 ft, top anhydrite 2011 ft, top salt 2060 ft, top Yates 2990 ft, top brown lime 4646 ft, salt w 4906-08 ft, dr 4945 ft; A. L. Wasson 1-B-53, near nec se¼ PSL sec 53, dr 3640 ft. Conoco-A. G. Carter's A. L. Wasson 2, nec PSL sec 48, blk AX, dr 4560 ft; Wasson 3, SEc sec 48, dr 4555 ft; Wasson 4, SWc sec 48, dr 4330 ft. Humble's T. S. Riley 1, nec sec 381, blk G, CCSD&RGNG Ry. sur, top anhydrite 2120 ft, td 4995 ft, used 7000 gals acid and flowed 13 bbls hourly, 5½ percent water. Phillips-I.T.I.O. Co.'s T. S. Riley 1, nwc sec 345, blk G, dr 315 ft. Shell's R. A. Cox 1, nec sec 380, blk G, CC&SDRG&NG Ry. sur, elev 3537 ft, top anhydrite 2040 ft, swabbed 95 percent sul water at 4995 ft, pb to 4970 ft, swabs all water; G. N. Robertson 1, nwc ne¼ sec 344, blk G, sd 190 ft.

GARZA COUNTY—M. L. Richards et al's J. B. Slaughter 1, se se se of T. T. Ry. sec 5, blk 8, elev 2870 ft, dr 2750 ft.

HOCKLEY COUNTY — Texas Co.'s Bob Slaughter Blk 2 (6219-ac), sec labor 92, Zavalla C.S.L. sur, league 37, elev 3531 ft, top anhydrite 2222 ft, cem 7-in 4750 ft, rust. Sid Richardson et al's Slaughter 1, swc labor 59, league 39, Maverick C.S.L. sur, mim.

LYNN COUNTY — C. H. Hutto et al's Brownfield 1, near c of E.L.&R.R. Co. sec 6, blk A-1, core test, trace oil 665-70 ft, sd for cas.

MARTIN COUNTY—J. L. Greene, R. C. Conkling & T. R. Parker's O. B. Holt 1, labor 20, league 319, Garza C.S.L. sur, elev 2907 ft, top anhydrite 2050 ft, top salt 2070 ft, top Yates 2990 ft, top first lime stringer 4365 ft, top solid lime 4468 ft, sul w 4751-4753 ft, dry and abd. Harris-Anderson Corp.'s Mrs. M. Robinson 1, c sw¼ of T&P Ry. sec 33, blk 36, T-1-N, cem sur cas.

YOAKUM COUNTY—American Liberty Oil Co.'s C. A. Thomas 1, near nwc sw¼ sec 864, blk D, J. H. Gibson sur, elev 3592 ft, top Yates 2975 ft, testing 1500 ft oih at 4949-5030 ft. Denver P&R Co.'s Whittenburg 2-A, c ne nw sec 830, blk D, J. H. Gibson sur, rur; Whittenburg 2, c ne ne sec 381, blk D, elev 3623 ft, dr 4500 ft. Honolulu Oil Corp.'s R. E. Bennett 2, ne se ne sec 677, blk D, J. H. Gibson sur, dr 5010 ft; Bennett 3, dr 2400 ft. J. W. Murchison & L. Fikes' M. B. Sawyer 1, c sw se sec 702, blk D, elev 3623 ft, top anhydrite 2256 ft, dr 3850 ft. Phillips Drl. Co.'s W. A. O'Brien 1, nec sec 441, blk D, lcn. E. H. Pitkin & Lou Stogner's J. A. Blades 1, c ne ne sec 103, blk D, elev 3851 ft, top anhydrite 2393 ft, top Yates 3230 ft, dr 4515 ft. Shell Pet. Corp.'s R. Bennett 1, ne se ne sec 677, blk D, dr 4700 ft; J. H. Lynn 1, c sw sw sec 798, blk D, elev 3623 ft, dr 4550 ft; Geo. Baumgart 1, 440 ft fr w & 1320 ft fr s lines sec 828, blk D, elev 3587 ft, top anhydrite 2200 ft, top Yates 3020 ft, top lime (solid) 4470 ft, cem 5-in cas 4875 ft. Skelly-Sun's J. A. Kiser 1, c ne ne sec 640, blk D, elev 3657 ft, top anhydrite 2183 ft, base salt 2890 ft, top Yates 2980 ft, top brown lime 4045 ft, top solid lime 4540 ft, pb fr sul w at 5285-5300 ft to 5261 ft, testing. Standard of Texas' M. B. Sawyer 1, c se se sec 576, blk D, elev 3669 ft, tested mostly water after shot 5403 ft, pb to 5269 ft. Sun's J. H. Lynn 1, c ne ne sec 798, blk G, mim. T. P. Coal & Oil Co.'s Ruth Bennett 3, swc nw¼ sec 678, blk D, mim. Texas Co.'s N. W. Willard 1, c sw sw sec 799, blk G, mim; Willard 2, c nw nw sec 799, mim. P. N. Wiggins, Jr., et al's Bartlett 1, nec sec 359, blk D, elev 3780 ft, top anhydrite 2320 ft, top gray lime 4558 ft, top oil stained lime 5190 ft, dr 5340 ft.

SOUTH TEXAS

SAN ANTONIO DISTRICT

ATASCOSA COUNTY—Stieren's T. A. Crawford 1, J. O. Crawford sur 69, pulling liner to dd from 3476 ft.

BASTROP COUNTY—Bibb et al's Lentz 1, F. Wilkinson sur, dr 2427 ft. Franklin's Thaxton & Yarrington 1, Bangs sur, temp. abd, 550 ft. Hantho-Nelson, Inc.'s, K. M. Litton 2, A. Litton sur, set csg at 1905 ft, top chalk 1907 and below chalk 2194 ft.

BEXAR COUNTY — American Gas Co.'s Oliver 5, M. F. Rodriguez sur, pulled 5½ in and reset at 3000 ft, will recement and try to comp, td 3495 ft. Ball & DuBose's F. & Maud Miller, J. Christopher sur 55, prep to sp. Rosenburg's Carle 1, F. Rolen sur 48, dr 210 ft.

CALDWELL COUNTY—Brady Bros. & Pummel's Jackson 1, S. Morris sur, dr 2207 ft. Gillock's Kelley 1, F. Berry sur, sd 1841 ft.

DIMMITT COUNTY—Paul Teas & Maryland Corp.'s S. E. McKnight 1, I&GN RR sur, dr in ch 5020 ft.

EDWARDS COUNTY—Dan Auld et al's L. K. Henderson Est. 1, HE&WT sur, sd for csg to shut off wtr snd 1845 ft. Evans and Love's S. Brown 1, sec 66, dr 3503 ft (owdd).

FRIO COUNTY—Amerada's R. Melms 1, N. C. Alexander sur, fsg 3921 ft, gas blow kicked tools 35 ft up into hole, tools dropped. Pagenkopf & Jamieson's Houston Estate 1, J. Figuerroa sur, prep to remove cem. plugs and test ch again, 2651 ft.

GONZALES COUNTY—W. B. Osborne's Wells Ranch 1, sec 8, Wells Ranch subd, abd 4289 ft.

GUADALUPE COUNTY — Al Buchanan Prod. Co.'s M. T. Howell 1, Jacob Darst sur, prep mir. Carver-Kallison Oil Co.'s Charles A. Burris 1, Ira Nash sur, dr 210 ft; T. C. Howell 1, Ira Nash sur, dr 1707 ft. Housel Oil Corp.'s N. J. Carter 2, S. Highsmith sur, wo pump, 2315 ft. Kreiter & Douglas' F. P. Oliver, R. Smith sur, dr 1304 ft. Mehu Oil Inc.'s W. F. Schulze 1, F. Chenault sur, abd 1620 ft. Riddle Oil Co.'s C. A. Krueger 1, J. M. Thompson sur, dr 831 ft.

KENDALL COUNTY—Landon & Holifield's C. A. Sidensticker 1, A. Rodriguez sur, dr ahead 542 ft.

MAVERICK COUNTY — Theingold and Rueben's Johnston 1, I&GN RR blk 16, temp. abd 1800 ft.

ZAVALA COUNTY—H. F. Wilcox O&G Co.'s T. J. Gilliam, GWT&P sec 11, coring below 3950 ft.

LAREDO DISTRICT

DUVAL COUNTY — Frank J. Gravis' F. Vaello et al 1-A, San Andres gr, coring 5075 ft, 7 minute dst rec 25 stands sw; R. Schallert 1, sur 239, sd 3325 ft. Magnolia's DCRC 1, sur 61, lcn; A. Lopez 1, sur 82, ru. Rudco's K. L. Ellis 1, GC&SF sur 308, coring 2488 ft. Taylor Ref. Co.'s A. Parr 2, sur 279, dr 5302 ft.

JIM HOGG COUNTY—Darby Pet. Co.'s R. Holbein 1-C, sec 20, set 7 in 1770 ft, wocs, Cole sand 1771-1815 ft. French Oil Corp.'s P. V. de Garza 7, sur 269, lcn.

McMULLEN COUNTY — Mills Bennett's

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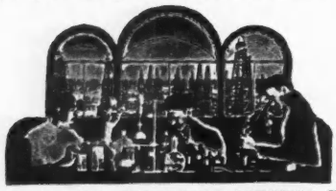

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PATENTS—INFRINGEMENTS—OPINIONS
San Antonio—Washington, D. C.
2014 SECOND NAT'L BK. BLDG.—HOUSTON
1507-11 TOWER PETROLEUM BLDG.—DALLAS

Nueces Land & Liveestock Co. 1, sur 166, ru. Richardson & McCarty's Henry R. Martin 1, Emil Weiting sur 6, dr 572 ft, (well abd at 525 ft on 5-2-37). C. C. Shumway's Shiner Ranch 12, G. J. Goode sur, abd 1806 ft.

STARR COUNTY—J. L. Collins & Co.'s A. Guerra 1, sh 6, wocs, squeezed off perfs 6126-30 ft. Sun's H. P. Guerra 1-F, por 109, abd 3916 ft.

WEBB COUNTY—Mills Bennett's Gates 2, CCSD&RGNG sur, dr 2203 ft. O. W. Killam's Bruni Est. 4, sur 585, dr 2203 ft. Kirkwood & Morgan's Garcia & Villareal 1, sur 720, reaming down to take core, test again, td 1953 ft. C. H. Lewis' C. G. de la Garza 1, sec 48, dr 2465 ft. Moore & Meaders Garcia & Villareal 1, sur 338, perf in Mirando sand 2505 ft. G. G. Mortimer's Welhausen 1, sur 73, dr 107 ft.

ZAPATA COUNTY—H. M. Brown's J. Gutierrez 1, blk 12, lcn. Ray L. Martin's S. Vela 1, blk 77, mi heavier rig 100 ft.

CORPUS CHRISTI DISTRICT

BROOKS COUNTY — Standard of Texas' Mestina 10 (lse 1), R. G. Salinas sur, wocs, set 4 in liner at 2634 ft; Mestina 3 (lse 2), R. G. Salinas sur, wocs 510 ft.

DEWITT COUNTY—Trinity Pet. Co.'s C. D. Bolting 1, R. Galletty sur, abd 3800 ft.

GOLIAD COUNTY—Goliad Oil Co.'s S. E. Cole 1-A, lot 33, prep to perf liner below 5500 ft, td 5687 ft. R. B. Swiger's Carrie Wood 1-B, J. Shearn sur, td 5043 ft, wocs, will perf & swab 12-6.

HIDALGO COUNTY—Atlantic's Mrs. E. T. McCalip 1, sec 175, coring 8775 ft. Gulf States 2 Delta Orchards, sec 94, coring 7465 ft. Y & B Oil Co.'s 1, Waite Bros., reaming to dd 5558 ft, td.

JACKSON COUNTY—Hargrove & Crosby's Hodges 1, I & GN RR sur 7, to set csg abt 6400 ft & test snd 5265-70 & 6280-95 ft, indicated by elec formation tester. Harrison's H. A. Meyer 1, M. L. York sur, prep to run elec formation tester 4900 ft. Magnolia's A. West Ranch 1, R. Musquiz sur, dr 650 ft.

JIM WELLS COUNTY—Tom Graham et al's J. J. O'Donnell 1, SK&K sur, comp 5¼ in at 2307 ft, snd 2323-37 ft, 104.75 bpd, 3/16 in ch, tp 275, cp 475. H. M. Hill et al's B. Kuether 1, SK & K sur, prep to resume dr 2905 ft. H. H. Howell et al's J. R. Talbert Est. 1, La Vaca gr, tested sul/wtr, prep to perf 3600 ft. Magnolia's A. A. Seeligson 7, Los Jaboncillos sur, dst thru perfs 6585-95 ft, 10 min, ¼ in ch top & btm, rec 1000 ft light brown dist 775 lbs, running tbg for comp, td 8165 ft. H. J. Porter's Chas. Wolcott 1, tr 23, dr 5449 ft. Smith & Storey, Inc.'s J. C. McGill 2, N. Guessett sur 98, reported sp. Yukon Oil Co.'s Mrs. R. Schaefer 1, Z. Cuellar sur 11, abd 6514 ft.

KENEDY COUNTY—Sal Vieja Oil Corp.'s Garcia Land & Cattle Co. 1, sh 59, dr 7810 ft.

KLEBERG COUNTY—Cinco Oil Co.'s J. W. Kellam 1, KT & I subd, spudded. Magnolia's Anton Dietz 1, sec 7, dr 467 ft. Superior Oil Co.'s Theo. W. Koch 1, blk 32, sec 26, dr 5370 ft.

LIVE OAK COUNTY—James B. Chew & Hantho-Nelson's A. McNeill Bell 1, A. Parks sur, set 10¾ in at 465 ft, dr plugs. C. G. Grimes' W. A. Friedle 1, Refugio School Land sur 6, dr 3009 ft. Holland Oil Co.'s Alamo Lumber Co. 2, Live Oak-Bee Land subd 4, lcn. Loma's A. T. Pfluger, John Turner sur, sp. Ranco Oil Corp.'s Fee 1, J. Poitevent sur 3, dr 1925 ft. Reynosa Oil Co.'s W. O. Nichols 1-A, S. Ryan sur, abd 1482 ft. J. H. Turner's Dow Young 1, L. Ayres sur, sd, woo, 1013 ft.

NUECES COUNTY—Culton & Meaders J. L. Bailey Est. 1, blk 65, abd 6550 ft. L. A. Douglas' C. McKenzie 1, BS & F sur 419, dr 2005 ft. Richardson's J. O. Chapman et al 1, sec 43, dr 3010 ft. Sannix Oil Co.'s Emil Nesloney 1, Casa Blanco gr, coring 6320 ft (closed well). Southern Minerals Corp.'s R. King 3, blk 6, dr 3656 ft; Ida Walker 1, R. King sur, dr 4752 ft. Union Prod. Co.'s C. L. Galladay et al 1, R. Garcia gr, dr 5325 ft; A. B. Simmonds 1, Agua Dulce gr, dr 6789 ft.

REFUGIO COUNTY—Hogan Oil Co.'s J. S. Kelly 1, James Power sur, reaming 6338 ft.

SAN PATRICIO COUNTY — Argo Oil Corp.'s A. Soehnge 1, PJ & M Delgado gr, abd 6310 ft. A. L. Bob's J. F. Green Est. 2, T. T. Williamson sur, dr 5110 ft J. W. Cain's Mrs. Gertrude E. Guy 1, sec 70, lcn. Conroe Dr. Co.'s J. R. Dougherty, James McGloin sur, ru & sd. Rutherford & Tide Water's W. R. George 1, R. Saddler & J. Garcia surs, dr 5810 ft. F. P. Schwab's E. H. Lane et al 1, Cubage & Miller subd, ru.

VICTORIA COUNTY—W. V. Bowles & Co.'s D. L. Robertson Est. 1, T. C. Brunham sur, td 6138 ft, in sd/tr hole 5629 ft, will ream to 5625 ft & test again. Gulf's Mahon & Buehler 1, J. Poitevent sur 2, stuck ds, shot off & rec 6532 ft, td 7666 ft. Stanolind's Henderson & Pickering 1, E. Benavides sur, squeezing perfs to perf higher, td 7502 ft.

WILLACY COUNTY—Magnolia's F. Armendiaz 1, sh 4, still sd, dr wtr well, 7145 ft. Shell's Yturria Cattle Co. 2, sh 64, abd 8335 ft.

TEXAS GULF COAST

BRAZORIA COUNTY — Pure's Smith 1, Peach Point prospect, S. F. Austin sur, dr shale 6980 ft.

CHAMBERS COUNTY—Ingot and Merit Oil Co.'s Wright 1, Cedar Bayou area, C. Smith sur, woc 6431 ft.

COLORADO COUNTY—O. C. Garvey's B. Ernest 1, n of Eagle Lake, M. Lapham sur, dr shale 6050 ft.

GALVESTON COUNTY—Sun's Cade & Co. 1, Bolivar prospect, A. Dickson sur, lcn.

FORT BEND COUNTY—Chapman Minerals Corp.'s Sugarland Industries 1, s of Sugarland, G. Brown sur, waiting on orders 8010 ft.

HARDIN COUNTY—J. G. Mayo et al's Haden 1, Bragg area, W. K. Griffin sur, abn 6008 ft.

HARRIS COUNTY—H. C. Cockburn's White 1, Houston Ship Channel, Harris & Carpenter sur, abn 6017 ft. H. J. De Arman's Gieseke 1, Huffsmith area, J. Bunker sur, dr shale 5604 ft.

JEFFERSON COUNTY — J. E. Harwell's State 1, in Gulf of Mexico, Block 720, driving piling. G. H. McCarthy's Broussard Trust 1, Little Pine Island area, C. Hillibrandt sur, dr shale 6624 ft. Shell's McFaddin 1, McFaddin Ranch area, S. A. Pace sur, testing 5557 ft.

LIBERTY COUNTY—Humble's Moore 1, Devers area, M. Whittington sur, lcn.

MATAGORDA COUNTY—Sun's Robbins 1, n of Citrus Grove, C. H. Vandeveer sur, dr shale 7750 ft.

POLK COUNTY — National Standard Oil Co.'s Carter Brothers 1, n of Segno, M. S. Womack sur, dr shale 1614 ft. Stewart Oil Co.'s Galloway 1, se of Livingston, J. W. Ringold sur, dr shale 1050 ft.

WALLER COUNTY—J. Bryan Eby et al's Rice 1, Waller prospect, J. H. Stephenson sur, dr shale 7371 ft.

WHARTON COUNTY—Strake's Strunk 1, Lissie area, L. P. Jennings sur, dr shale 4509 ft. Texas Co.'s Johnson 1, Hillje area, J. Bognal sur, dr shale 5050 ft.

WASHINGTON

GRAY'S HARBOR COUNTY—Simms Oil Co.'s Simms 1, cable tools, Washington structure, 9 miles ne Aberdeen, sg at 1920 ft, sd. Southwest Synd.'s (T. O. Toons), Simms 1, 1000 ft sw Simms Oil Co.'s test, lcn, to move in rotary.

St. Johns buys spudder for developing leases in Cuba

The St. Johns Oil Company has purchased another spudder to be used in developing production in the provinces of Santa Clara and Matanges, Cuba, according to reports issued last week. The company has about 10 wells producing in the Cuban area, which, although shallow producers with light flow, are said to be making 60 gravity oil.

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SULPHUR-BASE OIL
The Ridge Tool Company

The Ridge Tool Company, Elyria, Ohio, recently announced the development of a sulphur base cutting oil in which a new antiseptic quality is present.

Besides the antiseptic quality, Ridgoil is highly satisfactory for cutting smooth clean threads on iron, steel or brass pipe, according to the manufacturer. The oil penetrates quickly, cools and lubricates, and will not congeal above 20 degrees F.

SQUIRREL-CAGE MOTORS
The Reliance Electric & Engineering Company

The Reliance Electric & Engineering Company, 1088 Ivanhoe Road, Cleveland, Ohio, announces a new line of explosion-proof squirrel-cage alternating current motors, known as type AA.

These motors have been tested and approved by The Underwriters' Laboratories for hazardous locations which include those in which flammable volatile liquids, highly flammable gases, mixtures or other highly flammable substances are present. The construction is such that all working parts are completely enclosed, and the housing is strong enough to withstand even an internal explosion without bursting, loosening the joints, or permitting flame to escape into the outside air. Rotors are integrally cast to assure reliability and uniformity of performance.

COTTON TIRE CORD
The B. F. Goodrich Company

The B. F. Goodrich Company, Akron, Ohio, recently developed a new type of cotton tire cord, designed primarily to reduce heat generated at high speeds in truck and bus tires.

The new cord, developed after months of research, is of entirely different construction, according to the manufacturer, who states that on tests where other tires failed prematurely, tires built of this new high-flexing cord ran two and three times longer. It is claimed that this new perfected cord gives unusual strength without bulk and materially reduces operating temperature of tires.

VAPOR GENERATOR
Herbert Garnett

Herbert Garnett, Maunee, Ohio, recently placed on the market a device designed to be slipped inside smooth-bore nozzles, which will develop a solid blanket of vapor for extinguishing fires.

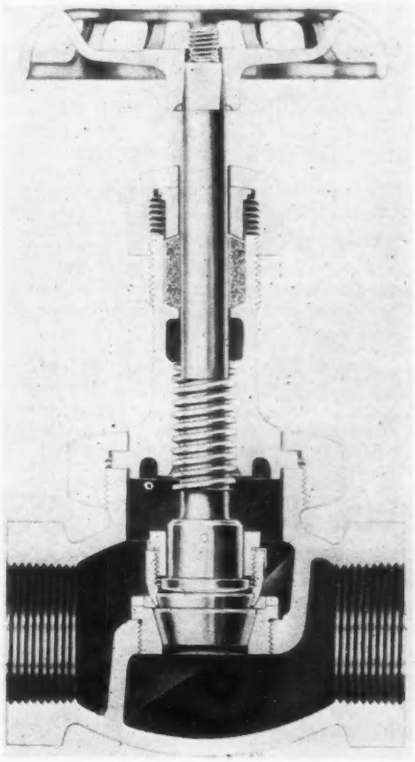
This vapor generator cannot be blown out under pressure, and locking screws prevent its falling out when nozzle is removed from shut-off. It is equally efficient with either shut-off pipes or the Underwriter style pipe.

The device operates as follows: Vapor is generated through water impingement on the outer surface of the generator head, which forms a pear-shaped envelope. In the center of the head are four holes through which other streams pass, impinging on a breaker which forms four separate pear-shaped masses of vapor located inside the outer envelope. The cross-sectional denseness of these five vapor envelopes in itself excludes oxygen from fire surface, and the additional expansion of the water particles into steam, approximately 1700 to 1 in volume, forms water vapors best calculated to extinguish fire. Experience has shown that water in the form of vapor is from five to ten times more effective than when a solid stream is used. This feature is of incalculable importance in rural fire fighting where total available water may be carried in apparatus booster tank only.

The Garnett vapor generator is available in three different sizes.

PLUG-TYPE VALVE SEAT
Jenkins Bros.

Jenkins Bros., 822 Washington Boulevard, Chicago, Illinois, have just announced No. 976 plug-seat valve that features a plug and seat ring made of Jenkins JX500, a stainless steel having a Brinell hardness in excess of 500.



Jenkins No. 976 Plug-Seat Valve

This valve is specially recommended for severe service, such as continuous throttling for pressure reduction or free blow duty, such as soot blowers, injectors, heating coils, or any steam line where close regulation is required.

OKLAHOMA GEOLOGY

Bulletin No. 57 has just been released by the Oklahoma Geological Survey, Norman. The work covers the Muskogee-Porum district of Muskogee and McIntosh counties. The volume was prepared under the cooperative arrangement of the United States Geological Survey and the Oklahoma survey.

Charles W. Wilson, Jr., of the federal survey is the author and there is a chapter on carboniferous stratigraphy by Norman D. Newell of the Oklahoma survey.

MAGNETICALLY CONTROLLED WELDERS
The Hobart Brothers Company

The Hobart Brothers Co., Troy, Ohio, recently announced a new line of simplified arc welders, redesigned to operate magnetically instead of manually, providing complete overload and under voltage protection.

When the welding load is such as to require the full rated horsepower of the motor, the operator "flips" a small toggle switch to "high" position and presses the starter

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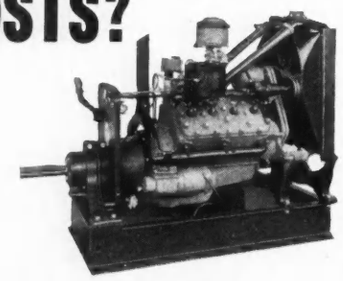

50 H.P. with KRW-V8 Unit using natural gas (1125 BTU) @ 30c per 1000 cu. ft. **$ 46.80** per month

50 H.P. with KRW-V8 Unit using gasoline @ 10c per gal. (no tax). **145.60** per month

Above figures show primary fuel costs (lubricating oil not included) for operating a KRW-V8 Unit to develop 50 H.P. for 10 hours per day—26 days per month. Compare this with electricity @ 3c per KWH which amounts to $340.60 per month. You can pay for a KRW Unit in a few short weeks **out of actual savings!**

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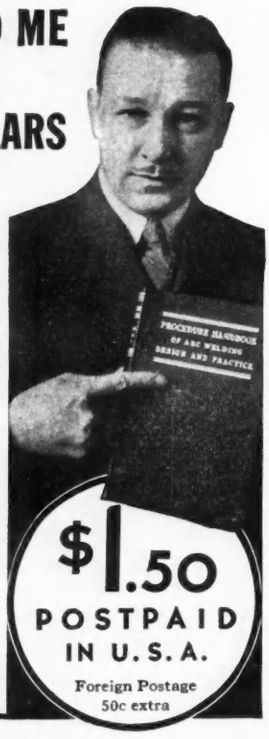

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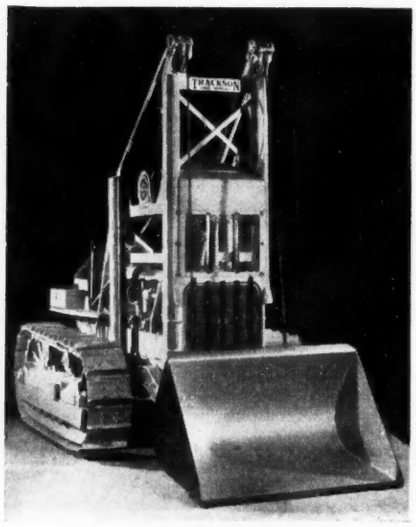
button. The motor then starts under reduced voltage with about one third the starting current usually drawn when starting across the line. As soon as the machine come up to speed, the switch automatically changes over to the normal, full-load running position.

If one half the rated horsepower of the machine is sufficient for the job at hand, the operator flips the toggle switch to "low" position. In this case, when the starter button is pressed, the machine starts and runs without changing over to the full-load position. It is claimed that this arrangement is equivalent to supplying two motors and saves 30 to 50 percent on current costs.

DIGGER AND LOADER

Trackson Company

Trackson Company, 3333 South Chase Avenue, Milwaukee, Wisconsin, has available on Caterpillar tractors a new heavy-duty digger and loader, known as Trackson High Shovel. This new shovel will excavate in clay, gumbo or rocky soil, dig slush pits, erect dikes and levees, do stripping, leveling and subgrading, remove snow and transport or load all kinds of bulk materials.



Trackson High Shovel

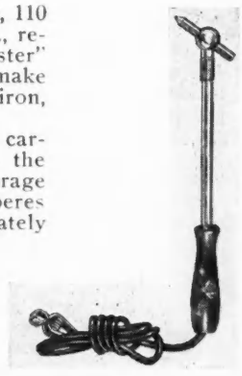
The Trackson High Shovel is regularly equipped with a ¾-yard bucket, and will dig, move and load up to 50 cubic yards per hour. The advantages claimed for this machine are: A fast mechanical hoist which is not affected by weather temperature; independent front end drive; free dumping of the bucket at any point of the lift; automatic release when bucket reaches maximum height; full visibility for the driver, and many other features.

ELECTRIC WELDER

Gordon Manufacturing Company

Gordon Manufacturing Company, 110 East 23rd Street, New York, N. Y., recently introduced its new "Master" electric arc welder designed to make quick and permanent repairs on iron, steel, brass, copper and tin.

This welder uses a low voltage carbon which gets white hot from the current of an ordinary 6-volt storage battery. It uses about 20 to 25 amperes of current to develop approximately 7000 degrees of heat, and requires no mechanical knowledge to operate.

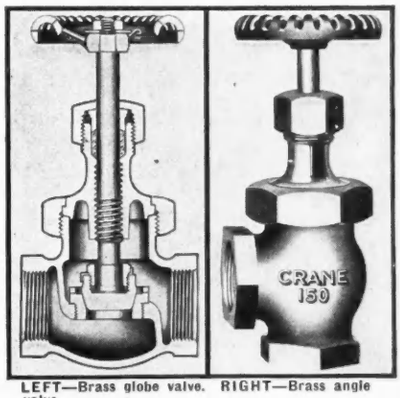


Gordon "Master" Electric Welder

BRASS GLOBE AND ANGLE VALVES

Crane Company

Crane Company, 836 South Michigan Avenue, Chicago, announces development of a new line of brass globe and angle valves with plug-type disc of Crane nickel alloy and body seat ring made of Exelloy, a specially heat treated chromium iron. This new line of valves has been developed for severe service on small lines carrying steam, hot water, cold water, oil, gas and similar fluids. The new combination of metals is considered ideal for seating surfaces, having excellent resistance to wear, temperature, galling and scoring.



LEFT—Brass globe valve. RIGHT—Brass angle valve.

Made in sizes ⅛ to 3-inch, these valves are recommended for 150 pounds steam working pressure and 300 pounds on cold water, oil or gas lines. Their wide seat bearing is unusually resistant to wire drawing and foreign matter, and their tapered disc permits easy flow regulation when throttling.

The stuffing boxes of these valves are fitted with a gland and filled with high grade packing and may be repacked while under pressure when wide open.

These valves are similar to the Crane 14-P and 16-P brass valves and if any users of the latter should want to convert them to the new line, all that is necessary is to secure new discs and seats, all parts being interchangeable.

SAFETY FLARE

Burgess Battery Company

Burgess Battery Company, Freeport, Illinois, recently designed a safety flare which provides a powerful red beam of light from any position. Its lens has no dark or dead zones and can be readily seen even when tipped over on the highway.

The flare is constructed to withstand the rough usage encountered in fleet service. It is water-proof and dust-proof, with flag holders permanently welded to the flare body. It is available singly or in groups of three in a special heavy gauge metal container.

DIESEL BATTERIES

The B. F. Goodrich Company

The B. F. Goodrich Company, Akron, Ohio, announces a complete line of specially constructed batteries for Diesel starting service. In the line are 4 6-volt types, 2 8-volt types and 10 12-volt types.

According to the manufacturer, these batteries are built with thinner plates than heavy-duty types, giving instant reaction and quick motor turnover. Adequate power is available instantaneously to ignite the fuel oil and start the motor in coldest weather.

All batteries, except the 8-volt types, are assembled in hard rubber cases. The 8-volt types are assembled in hard rubber jars and wood cases. Connectors are of solid lead, except the 8-volt types, which are of flexible copper with lead coating to prevent corrosion.

Cell covers are made of reinforced hard rubber, terminal posts are of the braced type, with rubber gasket seals and locknuts to prevent acid seepage, allowing for vibration of plates without causing damage. Splash-proof vents are used and ample sediment space provided to prevent battery failure as a result of short circuits arising from an accumulation of sediment touching the plates.

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This Week with the Industry's EQUIPMENT SUPPLIERS

American Meter Company Elects McKean Vice President

American Meter Company, New York, announces election of Norton McKean as vice president.

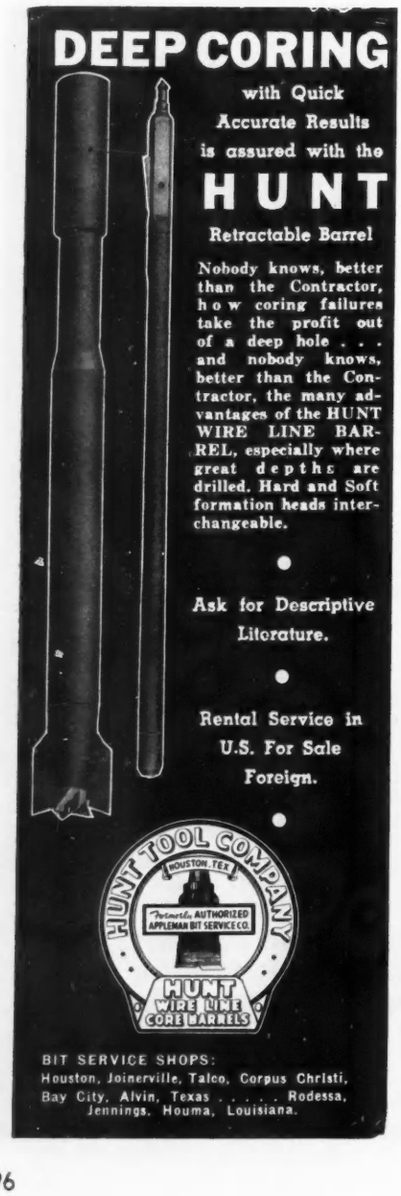
McKean first became connected with the company in 1919 as superintendent of the Boston plant, after which he was made general superintendent of the corporation and manager of the Albany plant—D. McDonald & Company Works. He will continue in those executives duties.

Forcum Heads Paramount Texas Division

Paramount Equipment Company, Tulsa, announces that C. L. Forcum will have charge of the company's Texas division, with headquarters at Dallas.

Forcum formerly represented the company at Casper, Wyoming, and his appointment to the Texas territory follows recent announcement of its plans to expand distribution and service.

Forcum worked in the Oklahoma, Texas and Kansas fields prior to entering the oil field supply business several years ago.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General Electric Company Promotes J. W. Dunbar

General Electric Company has announced appointment of J. W. Dunbar, formerly in charge of magazine advertising for the incandescent lamp department of the company at Nela Park, Cleveland, as assistant to C. H. Lang, advertising manager. Dunbar's headquarters will be at 570 Lexington Avenue, New York, where he will devote his principal attention to the selection of media.

Dowell Makes Changes In Personnel

Dowell Incorporated, subsidiary of Dow Chemical Company, recently announced several important appointments and changes in its personnel.

W. E. Reardon, formerly district manager at Seminole, Oklahoma, has been transferred to the general office at Tulsa as assistant manager.

W. J. Russell, who was district manager at Tulsa, succeeds Reardon at Seminole, having charge of treating stations at Tulsa, Seminole, and Stonewall.

H. W. Ross has been appointed assistant sales manager and is located at Tulsa.

P. J. Lehnhard has been promoted from treating engineer to research engineer on the general office staff at Tulsa.

E. S. Villines has been transferred from Hobbs, New Mexico, where he served in the capacity of treating engineer, to Tulsa, as manager of the Tulsa station.

Ward B. Tennis, formerly station manager at Great Bend, Kansas, has been promoted to district sales engineer at Wichita. Jack Sutherlin succeeds Tennis as station manager at Great Bend.

Dowell Incorporated has also announced the establishment of a Panhandle district office in the Rule Building, Amarillo, Texas, with R. L. White as district manager. The treating station is located at Borger, Texas, with O. W. Lyons as station manager and R. L. Shrewsbury as treating engineer.

A new district office has also been established at Stamford, Texas, with Fred R. Holland, formerly station manager at Ada, Oklahoma, as district manager. C. F. Wilkes is treating engineer, having been transferred from Cody, Wyoming. The district office at Wichita Falls, Texas, has been discontinued. However, treating facilities will be maintained in Wichita Falls.

Larkin Packer Company Moves Hobbs Warehouse to Rodessa

Larkin Packer Company has discontinued its warehouse at Hobbs, New Mexico, and has replaced it with one at Odessa, Texas, with Bill Graham as warehouseman.

Ollie Holmes, formerly at the Hobbs store, is now warehouseman at the company's new warehouse at Great Bend, Kansas.

Hunter Becomes Manager for American Hoist & Derrick

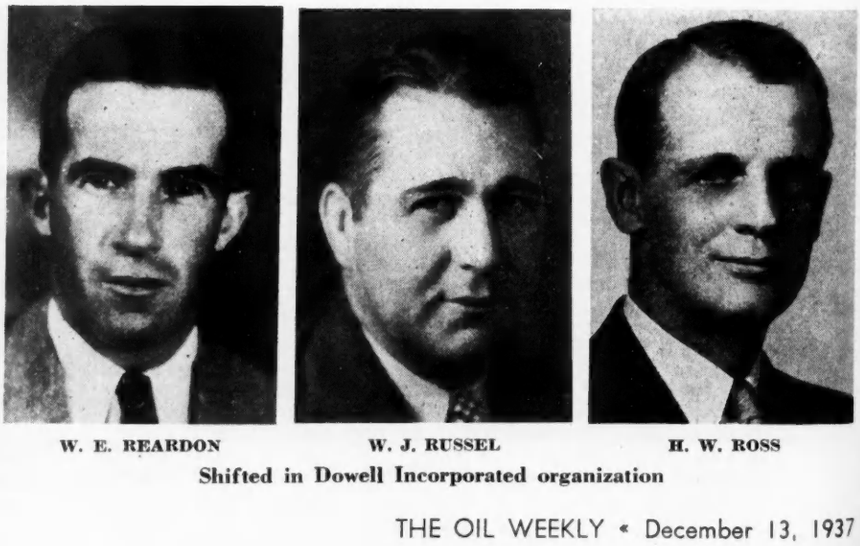
American Hoist & Derrick Company, Saint Paul, Minnesota, announces the appointment of Stanley M. Hunter, as manager of sales. Hunter has been associated with the company for the last two years.

Oil City Brass Works Installs Large Lathe

Oil City Brass Works, Beaumont, Texas, announces that it has installed one of the largest turret lathes in the South. The new lathe, a 3-X-H Libby-International, with 10¾-inch hollow spindle and 96-inch bed length, weighs approximately 28,000 pounds. The complete equipment as assembled by the company includes the latest developments in tooling for oil field equipment.

Briggs Representative for Union Wire Rope Corporation

Union Wire Rope Corporation, Kansas City, Missouri, has announced appointment of J. E. Briggs as sales representative in West Texas and Texas Panhandle district. He will make his headquarters at Lubbock, Texas.



W. E. REARDON W. J. RUSSEL H. W. ROSS

Shifted in Dowell Incorporated organization

Squeaks from the Bull Wheel

Liberality in Reverse

"Look whut de good Lawd is done for youall," exhorted the Negro preacher. "You ought to give a tenth of all you gits."

"Amen," shouted a perspiring brother catching the spirit of the occasion, "but a tenth ain't enough. Ah say le's raise it to a twentieth."

Readin' and Writin'

The firm received a carefully written if somewhat clumsily expressed letter from a hillbilly asking further particulars.

To this, in the usual business way, was sent a typewritten answer. Almost by return mail came a reply:

"You fellows need not think you are so all-fired smart and you need not print your letters to me. I can read writing."

Smart Boy

A tourist stopped his car on the road and asked a little country boy how far it was to Smithville.

The little boy replied: "It's 24,999 miles the way you're goin', but if you turn around it ain't far.

Followed Orders

The young and keen police officer was being shown his new night beat by the sergeant. "D'ye see that red light in the distance? Well, that is the limit of your beat. Now along with you."

The young policeman set out, and was not seen again for a week. When he did show up at headquarters, the sergeant demanded furiously where he had been.

"You remember that red light?" asked the cop.

"Yes."

"Well, that was a bus bound for Chicago."

Not So Dumb!

The district attorney was having his hands full in attempting to cross-examine an Indian.

"Answer either yes or no," shouted the lawyer.

For the fifteenth consecutive time the Indian just stared at the barrister and replied: "Ugh."

By now the district attorney was tearing his hair.

"What's the matter with you?" he screamed. "Can't you say anything but Ugh?"

"Sure I can," snapped the Indian. "But I had radishes for lunch!"

What's This?

"Is he really as fast a runner as they say?"

"Is he fast? Say, he can run so fast that all the men he races with have to run twice as fast as he does to keep up with him."

Old Reprint

"Is McPherson in?"

"Aye, but he's very busy; he's sharpening the phonograph needle for the party tonight."

Likes It Real

The ladies church society was having one of its banquets. In line with custom, the president, a sweet old soul, sat next to the minister.

First on the program was a solo: The Evening Star, from Tanhauser, sung in German.

At its conclusion, madame president confidentially whispered to the minister:

"I'd like those songs just as well if they sang them in English like the apostles did."

Scat

Visitor: "I don't like to be inquisitive, but what are the four holes in the door for?"

Mountaineer: "We got four cats."

Visitor: "But why didn't you have one good-sized hole?"

Mountaineer: "Stranger, when I say 'Scat' I mean 'SCAT'!"

Wasn't Hollow

Mrs. Newed entered the dining room and proudly placed the turkey on the table. "There you are, dear, my first Thanksgiving turkey!" she exclaimed.

Mr. Newed gazed with admiration. "Wonderful, darling," he said. "How beautifully you have stuffed it!"

"Stuffed!" she echoed. "But, my dear, this one wasn't hollow!"

Needs No R. S. V.P.

Wife—Shall I serve alphabet soup when your rich brother dines with us.

Husband—I should say not. It might remind him of some of my I. O. U.'s.

Hush Money

Pop: "Well, I received a note from your teacher today."

Son: "Honest, Pop? Give me a quarter and I won't breathe a word about it."

Not Fit for Print

The reporter limped up to the newspaper editor.

"Well," growled the editor, "did you get the interview?"

The newsman pointed to a pair of black eyes.

The editor banged his desk.

"We can't print a pair of black eyes. Where's the story?"

The reporter lifted his hat and displayed a huge bump on his head.

"Look," he repeated.

The editor went wild.

"What good is that?" he howled. "We can't print things like that. Didn't you get the chap to say a few words?"

The reporter wiped a bloody nose.

"Sure," he nodded, "but you can't print that either!"

A Hot One

Chemistry Professor: "Jones, what does HNO3 signify?"

Jones: "Well, ah, er, I've got it right on the tip of my tongue, sir."

Chemistry Professor: "Well, you'd better spit it out. It's nitric acid."

PRACTICAL PETROLEUM ENGINEERS' HANDBOOK

By **JOSEPH ZABA, E. M. M. Sc.**
Petroleum Engineer, Rio Bravo Oil Company
and
W. T. DOHERTY
Division Superintendent, Humble Oil & Refining Company

For a number of years there has been a growing demand for a handbook containing formulae and other practical information for the benefit of the man working in the production and drilling branches of the oil industry. So great has been this need that many engineers have tried to accumulate their own handbooks by clipping tables, formulae and figures from scores of sources.

The co-authors of this volume discovered by coincidence that each had been for a period of several years accumulating practical data which through their collaboration appears in this book. Both of them are men who have not only received theoretical training but who have had many years of practical experience as engineers in dealing with every day oil field drilling and production problems.

As a result of this collaboration of effort the publishers of this volume feel that it is a most valuable contribution to oil trade literature.

Its purposes are distinctly practical. The tables, formulae, and figures shown are practical rather than theoretical in nature. It should save the time of many a busy operator, engineer, superintendent, and foreman.

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